Why Legal Scholars Get Daubert Wrong: A Contextualist Explanation of Law's Epistemology

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WHY LEGAL SCHOLARS GET DAUBERT WRONG: A CONTEXTUALIST EXPLANATION OF LAW’S EPISTEMOLOGY

ALANI GOLANSKI *

I. INTRODUCTION

Legal proofs may reach the trier of fact only if they meet the standards set forth in rules of evidence. The threshold requirement is always relevance. Pursuant to the Federal Rules of Evidence, “[a]ll relevant evidence is admissible, except as otherwise provided... Evidence which is not relevant is not admissible.”[1] “Relevant evidence” is that which has “any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.”[2]

This immediately suggests that evidence reaching the trier of fact has to be explanatory, not just broadly argumentative. Professor Salmon distinguishes the two in *A Third Dogma of Empiricism*, explaining that “[i]n deductive logic, irrelevant premises are pointless, but they do not undermine the validity of the argument.”[3]

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3. Wesley C. Salmon, *A Third Dogma of Empiricism*, in *Causality and...*
“Explanation, in contrast, seems to demand a further requirement—namely, that only considerations relevant to the explanandum be contained in the explanans. This, it seems to me, constitutes a deep difference between explanations and arguments.”

Argument without explanation—the possible mix, that is, of relevant and irrelevant information—could produce unjustified belief. Learning that A had robbed a bank in 1985 might lead one to believe that A is more likely to have murdered in 2000, but this belief would not be justified because the information is temporally remote and different in kind from the recent crime. Of course, A’s having murdered seven times in 1999 would strongly tend to make the existence of the charged crime more probable, but this evidence could be excluded for other reasons.

The Rules of Evidence try to promote the discovery of truth, not only justified belief. Rule 102 states that the purpose of the Rules is to create an evidentiary scheme “to the end that truth may be ascertained.” Law’s goal, then, is to position its triers of fact in such a way that they may acquire justified true belief (JTB), which is traditionally the tripartite criteria of knowledge.

A question yet to be answered, or perhaps asked, is what theory of knowledge comports with and underlies law’s fact-finding structures? As the title of this article suggests, contextualism may provide the neatest explanation. Versions of coherentism (generally, knowledge as a system of consistent, mutually explanatory true beliefs) and naturalized epistemology (generally, knowledge as a chapter of psychology to be empirically investigated, not intuited a priori) are also arguably latent, and these theories of knowledge have a strong explanatory appeal. This article argues that we can sort out law’s

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4. Id. at 97.

5. See e.g. Boyer v. U.S., 132 F.2d 12, 13 (D.C. Cir. 1942) (“No doubt the alleged fact that a man committed a crime on another occasion tends to show a disposition to commit similar crimes. But when the prior crime has no other relevance than that, it is inadmissible. Its tendency to create hostility, surprise, and confusion of issues is thought to outweigh its probative value.”).


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epistemological question by examining recent Supreme Court rulings on the admissibility of expert scientific and technical testimony, in particular, the landmark opinion in Daubert v. Merrell Dow Pharmaceuticals, Inc.7

Indeed, it is precisely law’s approach to scientific and technical proof, it seems, that clears the straightest path to contextualism. Most simply, law encourages and expects its fact-finders to know things. While these fact-finders are mostly non-experts, however, evidence is often technical or scientific. No one could reasonably expect triers of fact to know technical and scientific things the way experts in their respective disciplines do. The adverbial phrase is the point. Law expects fact-finders to come to JTB, hence knowledge, by some light. If fact-finders, or most of us generally, can know some of the science that scientists know, it must be because the evidence needed to know a proposition may differ in amount or kind depending on the circumstances in which we make our knowledge claims. The field is fertile for contextualism.

If contextualism is our best epistemological theory, why is the argument just now being made? Before Daubert, Frye v. United States8 was the received view. Frye stands for two propositions. First, that the central admissibility issue is whether proffered expert testimony coheres with the belief system of the relevant scientific community (a coherentist approach).9 Second, that the way we resolve the coherence issue in any particular case is by empirically investigating a psychological mechanism, namely, whether the scientific community has in fact generally accepted the expert’s methodological premises (a naturalized approach).10 While each of these propositions is consistent with a contextualist understanding of knowledge, each is also consistent with an invariantist one. Because coherentists and naturalists assume the latter approach, and because there is nothing obviously contextualist about Frye, the case has reflexively promoted the usual, invariantist view of knowledge.

So Frye does not necessarily represent an invariantist epistemology. Determining how strongly an expert witness’s beliefs cohere with the relevant community’s beliefs is itself a contextually

8. 293 F. 1013 (D.C. Cir. 1923).
9. Id. at 1014.
10. Id.
variable issue. Contextualism, however, was not effectively articulated in the epistemological literature until well after the District of Columbia Circuit issued Frye, and there was no apparent reason why legal scholars would have latched onto it.\textsuperscript{11} By the time the Supreme Court announced Daubert, legal scholars unquestioningly assumed invariantism and undertook to criticize the new ruling from that perspective.

This article demonstrates that the anti-Daubert scholarship has been misguided and sometimes bizarre. The reason for this is that Daubert cannot be analyzed coherently from an invariantist point-of-view, and yet scholars have so far taken this point-of-view for granted. Daubert is the first case to announce explicitly that non-expert judges, in their role as legal gatekeepers, have to determine whether a scientific expert "knows," and thereby whether "the reasoning or methodology underlying the testimony is scientifically valid..."\textsuperscript{12} If "know" means for the judge precisely what it means for the scientist, then judges would have to be scientists and their determinations would be influential and perhaps even controlling, not only in the courtroom, but within the particular scientific field.

Although this interpretation of Daubert is clearly untenable, it is the very one legal scholars have presupposed. If the Supreme Court had intended to use 'know' in this invariantist way, Daubert's critics would be correct in claiming that the ruling makes an unrealistic demand on the epistemic capabilities of most courts, and that judges in many cases should be trained scientists, and juries should be panels of blue-ribbon, scientifically-trained specialists. Surprisingly, legal scholars have failed to intuit the obvious counter argument: that because it is highly unlikely that Daubert expects federal judges to know in the way scientists know, carelessly requires judges to do what they cannot, or radically departs from settled constitutional mores by calling for the appointment of scientist-judges and blue-ribbon juries in a substantial number of cases, it is similarly unlikely that the Supreme Court uses 'know' in an invariantist way.

\textsuperscript{11} Although Peirce and Dewey were early contextualists. \textit{Collected Papers of Charles Sanders Peirce: Scientific Metaphysics} vol. 6, 38, 327, 331 (Charles Hartshorne & Paul Weiss eds., Harvard U. Press 1935); John Dewey & Arthur F. Bentley, \textit{Knowing and the Known} 282-85, 296, 315 (Beacon Press 1949); the leading view espoused in mainstream epistemology, at least until the past few decades, has been Cartesian foundationalism.\textsuperscript{12} 509 U.S. at 592-93.
In making this counter argument, this article is organized as follows: Part II summarizes the critical legal rulings on the admissibility of expert opinion testimony, especially Daubert; Part III discusses an important recent article by Scott Brewer that is critical of Daubert and fairly illustrative of much post-Daubert scholarship; Part IV argues that such scholarship fails to appraise Daubert’s epistemology accurately, and that the main problem is the absence of a contextualist perspective. More specifically, Brewer and others simply assume an invariantist epistemology and build their critiques around naturalist and various other invariantist insights to the exclusion of the contextualism that underlies law’s relation to scientific expert testimony. At the same time, like other anti-Daubert scholars, Brewer forgets his naturalized assumptions just when they might do the most good—in the analysis of the court’s practice in Daubert. This article also posits and responds to likely objections to a contextualist view of Daubert. Finally, Part V suggests the sort of criticism Daubert remains vulnerable to once we recognize it as a contextualist maneuver. The objections contained in this article to the anti-Daubert literature are not offered in support of Daubert, and ultimately the article remains neutral about whether the decision was a good one.

II. THE LEGAL RULINGS

The two-page Frye opinion issued in 1923 largely defines the way in which state and federal courts subsequently treated the question of the admissibility of scientific and technical proof. The specific issue in that second-degree murder case was whether exculpatory expert testimony about the result of Frye’s “systolic blood pressure deception” test (precursor to the polygraph machine) ought to have been allowed. In ruling it inadmissible, the court of appeals set forth its famous standard:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the

15. Id.
principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.\(^{16}\)

In 1975, Congress codified the Federal Rules of Evidence (Federal Rules or Rules) for the federal courts.\(^{17}\) From that point on, "[I]n principle . . . no common law of evidence remain[ed]," including *Frye*.\(^{18}\) Half of the states have since also adopted a version of the Federal Rules. While Article VII of the Federal Rules deals with various aspects of opinion and expert proofs,\(^{19}\) Rule 702 has been at the center of the interpretive controversy. It provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise . . . .\(^{20}\)

In 1993, the Supreme Court construed Rule 702 in *Daubert*.\(^{21}\) In that case, the plaintiffs were children born with birth defects allegedly caused by the antinausea drug Bendectin taken by their mothers during pregnancy.\(^{22}\) The district court had granted the manufacturer’s motion for summary judgment because its single expert showed that none of the published epidemiological research—more than thirty studies—had found Bendectin to be a human teratogen.\(^{23}\) Eight experts had testified on behalf of the plaintiffs, each concluding that Bendectin can cause birth defects based on the results of *in vitro* (test tube) and *in vivo* (live) animal studies, pharmacological studies of Bendectin’s chemical structure, and the "reanalysis" of previously published epidemiological (human statistical) studies.\(^{24}\)

\(^{16}\) *Id.* at 1014.
\(^{19}\) Federal Rules of Evidence 701 through 706 comprise Article VII. Fed. R. Evid. 701-706.
\(^{20}\) Fed. R. Evid. 702.
\(^{22}\) *Id.* at 582.
\(^{23}\) *Id.* at 582-84.
\(^{24}\) *Id.* at 583.
In the plaintiffs' initial appeal, the United States Court of Appeals for the Ninth Circuit discounted the animal and chemical studies because other courts had already ruled that these were "insufficient to establish a link between Bendectin and birth defects." The court also discounted the plaintiffs' reliance on reanalyses under the Frye standard, holding that "the reanalysis of epidemiological studies is generally accepted by the scientific community only when it is subjected to verification and scrutiny by others in the field."

The Supreme Court in Daubert vacated the Ninth Circuit's judgment, commenting that "a rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules and their 'general approach of relaxing the traditional barriers to "opinion" testimony.'" The Court stated that Frye's displacement by the Federal Rules of Evidence in the federal courts did not mean that there were no limits on the admissibility of purportedly scientific evidence. On the contrary, under the Rules, "the trial judge must ensure that any all scientific testimony or evidence admitted is not only relevant, but reliable." The Court then provided its epistemological analysis of Rule 702:

The subject of an expert's testimony must be "scientific... knowledge." The adjective "scientific" implies a grounding in the methods and procedures of science. Similarly, the word "knowledge" connotes more than subjective belief or unsupported speculation. The term "applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds." Of course, it would be unreasonable to conclude that the subject of scientific testimony must be "known"


28. Id. at 589.

29. Id. at 589-90 (quoting Webster's Third New International Dictionary 1252 (Merriam-Webster, Inc. 1986)).
to a certainty; arguably, there are no certainties in science. . . . But, in order to qualify as "scientific knowledge," an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation—i.e., "good grounds," based on what is known. In short, the requirement that an expert's testimony pertain to "scientific knowledge" establishes a standard of evidentiary reliability.  

Now the Court had to assure that judges themselves would be epistemically qualified to fulfill the "gatekeeping role" of screening proffered scientific testimony for evidentiary reliability. The Court stated that it was "confident that federal judges possess the capacity to" assess "whether the reasoning or methodology underlying the testimony is scientifically valid . . . ." According to the Court, the factors bearing on the inquiry were (1) whether the scientific theory or technique at issue could be, or had been tested, and thus whether it could be "falsified"; (2) whether the theory or technique had been subjected to peer review and publication; (3) the known or potential rate of error; (4) the existence of "standards controlling the technique's operation"; and (5) the extent to which the relevant scientific community accepted the theory or technique. Note that the Court derives the fifth factor from Frye as one of several factors by which a non-expert district court judge may ordinarily appraise scientific validity. The Court then stressed that the inquiry should be "a flexible one," and that "[t]he focus, of course, must be solely on principles and methodology, not on the conclusions that they generate."  

Responding to the manufacturer's concerns that liberalization of the "general acceptance" standard would result in a "'free-for-all' in which befuddled juries are confounded by absurd and irrational pseudoscientific assertions," Justice Blackmun, in the majority opinion, noted that the "respondent seems to us to be overly pessimistic about the capabilities of the jury and of the adversary system generally." Turning to the plaintiffs' objection that the screening role for judges would sanction "a stifling and repressive scientific orthodoxy and will be inimical to the search for truth," Justice Blackman countered that "there are important differences between the quest for truth in the courtroom and the quest for truth in the

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30. Id. at 590.
laboratory. Scientific conclusions are subject to perpetual revision. Law, on the other hand, must resolve disputes finally and quickly.\textsuperscript{41}

In his dissenting opinion, Chief Justice Rehnquist, joined by Justice Stevens, commented that “definitions of scientific knowledge, scientific method, scientific validity, and peer review were matters far afield from the expertise of judges.”\textsuperscript{42} On the Karl Popper influence, Rehnquist added, “I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its ‘falsifiability,’ and I suspect some of them will be, too.”\textsuperscript{43}

\textit{Daubert} has attracted much criticism, mostly along the lines suggested by Chief Justice Rehnquist, that Rule 702 ought not be construed to obligate or authorize judges to become “amateur scientists.”\textsuperscript{44} To a great extent, reform-oriented articles like the ones

\begin{enumerate}
\item 31. \textit{Id.} at 597.
\item 32. \textit{Id.} at 592-93.
\item 34. \textit{Id.}
\item 35. \textit{Id.} at 594.
\item 36. \textit{Id.}
\item 38. 509 U.S. at 594-95.
\item 39. \textit{Id.} at 595.
\item 40. \textit{Id.} at 596.
\item 41. \textit{Id.} at 596-97 (emphasis added).
\item 42. \textit{Id.} at 599 (Rehnquist, C.J., concurring in part, dissenting in part).
\item 43. \textit{Id.} at 600.
\end{enumerate}
discussed in this article follow suit. But, as one important legal commentator has recently explained, "[i]t is never an argument against the authority of the Court that it got its prior position wrong.... Whatever position it reaches is an authoritative statement of what the law is, technically and practically."45 This view, if applied to Daubert scholarship, suggests the complex and delicate interplay between two distinct social entities—the court and the scientific community. It is this scholarship, Brewer's included, rather than Daubert itself, that tends to conflate the differing epistemic attitudes and requirements of these institutions resulting in analytic incoherencies.

Indeed, bolstering the thesis that "[j]ustices are not going to be persuaded to change their views if we can just marshal one more cite or find one more article,"46 the Supreme Court in 1999 revisited the issue of how to interpret Rule 702, this time with respect to proffered technical, but non-scientific, testimony. In Kumho Tire Co. v. Carmichael, the Court concluded "that Daubert's general holding—setting forth the trial judge's general 'gatekeeping' obligation—applies

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46. Id. at 28.
not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge."\textsuperscript{47} Additionally, stressing the "considerable leeway" that must characterize the judge's gatekeeping mission, the Court stated:

\[\text{T}he \text{ Rules seek to avoid "unjustifiable expense and delay" as part of their search for "truth" and the "just determination" of proceedings. Thus, whether Daubert's specific factors are, or are not; reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine.}\textsuperscript{48}

\textit{Kumho Tire} is particularly interesting here not only because it steamrolls over nearly a decade of scholars' objections, but also by virtue of its facts. Daubert's critics have scrutinized the case's language and its standard, but legion post-Daubert rulings actually applying the gatekeeper standard have led the unexamined life. One assumes that Brewer, for instance, writing in 1998, would have looked at some of the federal decisions that have put Daubert into practice. He acknowledged that he is consumed by problems inhering in "the reasoning process by which non-expert legal reasoners defer to scientific experts,"\textsuperscript{49} as well as the institutional competence of scientifically non-expert judges and juries "to assess expert scientific evidence rationally."\textsuperscript{50} Except for a single sentence,\textsuperscript{51} however, Brewer has failed to examine any of these decisions.

This article's project is different from Brewer's, and it, too, will not look to any of these decisions, although someone could effectively argue that, in fact, federal judges and juries have not done all that bad

\textsuperscript{47} 526 U.S. 137, 141 (1999) (citation omitted).

\textsuperscript{48} Id. at 152-53; see General Elec. Co. v. Joiner, 522 U.S. 136, 143 (1997) (asserting that, in Daubert matters, the trial court must be shown "the deference that is the hallmark of abuse of discretion review.").

\textsuperscript{49} Brewer, supra n. 13, at 1539.

\textsuperscript{50} Id. at 1565.

\textsuperscript{51} Brewer refers to the 1994 case of Zuchowicz v. United States, 870 F. Supp. 15 (D. Conn. 1994), in support of his proposition that "[s]ome courts have essentially converted the Daubert test into the old Frye test, which, in turn, rests on assessing the credibility of persons who have the 'credential' of being members of the 'scientific community.'" Brewer, supra n. 13, at 1618. While the Zuchowicz opinion does initially review credentials, it also pays attention to "peer review and publication" and other Daubert factors, though perhaps overly stressing the "general acceptance" factor. 870 F. Supp. at 19.
of a job of rationally assessing proffered expert testimony for litigation purposes post-\textit{Daubert}.

Heidi Feldman, for instance, says that on remand, although the Ninth Circuit in \textit{Daubert} "expressed unease about judicial competence in applying [the \textit{Daubert} guidelines], it applied the decision quite ably."\footnote{Heidi Li Feldman, \textit{Science and Uncertainty in Mass Exposure Litigation}, 74 Tex. L. Rev. 1, 5, n. 23 (1995) (citing \textit{Daubert v. Merrell Dow Pharm., Inc.}, 43 F.3d 1311, 1315-16 (9th Cir. 1995)).}

\textit{Kumho Tire} is factually interesting in another way. The case arose out of an accident caused by the blowout of a minivan’s tire. The witness, Carlson, was a technical expert in tire failure analysis.\footnote{\textit{Kumho Tire Co. v. Carmichael}, 526 U.S. 137, 142 (1999).} Carlson concluded that a manufacturing or design defect had caused the blowout. His reasoning was that (1) a tire’s carcass should stay bound to the tread, (2) the tread had separated, (3) implicitly, his visual and tactile inspection could determine whether the tire had been abused, or "overdeflected," (4) the separation did not result from such overdeflection, (5) the separation therefore probably resulted from a tire defect, and (6) the separation caused the blowout.\footnote{\textit{Id.} at 144.} The district court, acting as a \textit{Daubert}-type reliability gatekeeper, excluded Carlson’s testimony,\footnote{\textit{Carmichael v. Samyang Tires, Inc.}, 923 F. Supp. 1514, 1521-22 (S.D. Ala. 1996).} and the Supreme Court upheld its decision.\footnote{\textit{Kumho Tire}, 526 U.S. at 158.}

The interesting point is that neither court had any problem with steps one through six of the expert’s analysis. That would have been enough to get Carlson’s testimony to the jury. The Supreme Court said that there would have been no problem had Carlson simply supported his conclusion with “the general theory that, in the absence of evidence..."
of abuse, a defect will normally have caused a tire’s separation.”58 In other words, Carlson would have been deemed to have known that the tire was defective had he kept his reasons and his testimony simple. He did not. Instead, he went on to “employ a more specific theory,” talking about four physical symptoms of overdeflection and his own idea that a defect probably exists unless two of those symptoms appear.59 Here is where Carlson’s cleverness limited his knowledge, and at this point the court could no longer attribute knowledge to him. In upholding the district court’s gatekeeper ruling, the Supreme Court stated:

We have found no indication in the record that other experts in the industry use Carlson’s two-factor test or that tire experts such as Carlson normally make the very fine distinctions about, say, the symmetry of comparatively greater shoulder tread wear that were necessary, on Carlson’s own theory, to support his conclusions.60

III. BREWER’S ARTICLE

Scott Brewer is a professor at the Harvard Law School, who earned his law degree from Yale and his Ph.D. in philosophy from Harvard. The crux of Brewer’s thesis is as follows: when expert scientific evidence is offered in a litigated case, competing scientific expert witnesses, not just a single authoritative “voice,” are presented to the non-expert judge and jury. The non-experts cannot “understand” the scientists, so they have to rely on a combination of credentials, reputation, and demeanor in evaluating the competing testimony.61 This sort of analysis “yield[s] only ‘epistemically arbitrary’ judgments,” justified from neither a scientific nor a legal point-of-view. An emerging norm of “intellectual due process,” however, places “epistemic constraints” on the legal decision makers’ reasoning.

58. Id. at 154.
59. Id.
60. Id. at 157. Technically, the Supreme Court’s mandate was a reversal of the Court of Appeals’ judgment, which had reversed the district court’s judgment on the ground that Daubert applied only in the scientific context, and not where an expert’s “skill-or-experience-based observation” is at issue. Carmichael v. Samyang Tire, Inc., 131 F.3d 1433, 1435 (11th Cir. 1997), rev’d.
61. Brewer, supra n. 13, at 1538.
processes, and counsels a "two-hat" solution by which legal decision makers will be scientists.

Brewer begins his 146-page article with the following hypothetical, a paradigm for his extensive analysis:

Suppose that two groups of expert mathematicians disagree about a complex mathematical question—say, whether Princeton mathematician Andrew Wiles really did solve "Fermat’s Last Theorem," which no mathematician had been able to prove since Louis Fermat first propounded it about 360 years ago. These experts have had an opportunity to hear one another's reasons for their competing conclusions about Wiles's proof, and neither group is convinced by the other. How might we decide which of the two groups is making the correct mathematical judgment? Here [is] a suggestion: Convene a group of twelve or so non-mathematicians, give them an opportunity to hear from representatives of each of the competing groups of mathematicians, and have the non-mathematicians decide whether Wiles's proof really succeeded. If the truth of the matter was among one's chief concerns, would this decision procedure seem sound? There is a serious reason to doubt it . . . .

Many legal systems, including the state and federal systems of the United States, use decision procedures that are disturbingly close to the one just imagined, procedures in which non-expert judges and juries are called upon and authorized to evaluate expert scientific testimony. This Article's goal is to offer a sustained critical analysis of the legal rules and doctrines that create and administer this procedure.

In his first two paragraphs, Brewer reveals both the main flaw in his thesis and a reason for believing that law's form substantiates a contextualist epistemology—not at all his point. First, the flaw. Brewer's hypothetical assumes that the group of non-mathematicians, numbering "twelve or so" to suggest the typical jury, would be convened to decide a question of mathematics, and that their decision

62. Id. at 1539.
63. Id. at 1677.
64. Id. at 1538 (citing Simon Singh, Fermat's Enigma 256 (Walker & Co. 1997)) (emphasis added).
would be binding on that discipline. This assumption is "disturbingly close" to his presupposition throughout, that the legal system calls on judges and jurors to decide questions of science and, perhaps, that these decisions are meant to rest on sufficient "understanding" to have at least some degree of currency within the pertinent scientific disciplines. 65 So Brewer self-justifies his assertion that "[i]t is precisely the lack of this kind of understanding in non-expert legal reasoners that casts doubt on their capacity to rely legitimately on expert scientific testimony in reaching practical decisions." 66

But judges and jurors do not decide questions of science. Here is a more accurate hypothetical: Two mathematicians disagree about which one has derived a proof of Fermat’s Last Theorem, which no mathematician had been able to prove for 360 years. Their proofs were simultaneously completed, but are contradictory and cannot both be correct. What is at stake is the Wolfskehl Prize, to be given to the first person to prove the theorem. How might we decide which of the two mathematicians is entitled to the Prize? A group of twelve jurors are convened, not to decide the mathematical question of which is the correct proof, but to decide the legal contractual issue of who is entitled to the Prize. Can the two be separated?

An analogy from the O.J. Simpson legal saga comes to mind. It seems that the jury in the criminal trial determined that he did not do it; it seems that the civil jury determined he did. If the proposition each jury weighed was "O.J. did it," then one jury could not have had JTB. Conversely, if both sets of jurors had JTB, then the proposition to be weighed could not have been "O.J. did it," but something else, different in each instance. Law probably does not violate the principle of excluded middle. Nonetheless, law, not Brewer, wants to say the jury did have JTB in each instance. As previously explained, the rules of evidence are developed "to the end that the truth may be ascertained and proceedings justly determined." 67 Equally acceptable, though, from law’s perspective, the criminal jury may have had justified belief that it had a reasonable doubt about truth, and so could not convict.

That is law’s reality, or at least its myth. Brewer says, maybe rightly, that "knowledge, however that concept is cashed out, seems too demanding for a system that consciously solicits competing expert

65. Id.
66. Id. at 1593.
scientific testimony . . ." So he uses “KJB” instead of “JTB” “to refer indiscriminately to knowledge and justified belief.” Either way, Brewer would say the non-mathematician fact-finder’s judgment about the Wolfskehl Prize contract issue, as much as about the Theorem’s proof itself, would be epistemically arbitrary, depriving the litigants of intellectual due process.

Even the more accurate hypothetical is not accurate enough. Here is a better one: Assume two mathematicians, A and B, disagree about which one has derived a proof of Fermat’s Last Theorem. Their proofs were simultaneously completed but differ in respect to one extremely obscure detail. A has announced Andrew Wiles’ slightly flawed 1993 proof, while B has announced Wiles’ correct 1994 proof. As was true when Wiles himself presented, A and B publish their respective proofs to a meeting of 200 mathematicians, only a quarter of whom “fully underst[an]d the dense mixture of Greek symbols and algebra that cover[s] the blackboard.” Again, what is before the non-mathematician jury is the issue of whether A or B is entitled to the Wolfskehl Prize.

As Wiles recounted, within two months of his 1993 presentation, one of the mathematician referees assigned a portion of the proof for verification detected:

[A]n error in a crucial part of the argument involving the Kolyvagin-Flach method, but it was something so subtle that I’d missed it completely until that point. The error is so abstract that it [cannot] really be described in simple terms. Even explaining it to a mathematician would require the mathematician to spend two or three months studying that part of the manuscript in great detail.

In the very accurate hypothetical, we will assume (in a departure, one hopes, from accuracy) that, although A and B now both realize A’s proof has failed, A’s attorney—perhaps working on contingency, or wanting to bill more hours, or simply consumed in self-assurance and

68. Brewer, supra n. 13, at 1596 (emphasis added).
69. Id. at 1601.
70. Id. at 1539, 1669-77.
71. Id. at 1538 (citing Simon Singh, Fermat’s Enigma 256 (Walker & Co. 1997)).
pride of reputation as a wily trial lawyer—somehow convinces A to press on with the litigation.

Earlier it was mentioned that Brewer’s opening hypothetical using Fermat’s Last Theorem revealed both the central flaw in his thesis and a hidden argument in favor of contextualism. Now, finally, we come to the contextualist point. Hearing from \( n \) mathematician witnesses, the jury arrives at JTB that A’s proof is in error, and that B is entitled to the Prize. Somehow, the jury knows what only the most honed mathematician can know. But the meaning of ‘know’ has obviously shifted. Brewer wants to keep the meaning of ‘know’ invariant, and \( m \)ay want to enlist a jury of the world’s leading mathematicians.

This is a good point at which to discuss Brewer’s “four possible routes” the law forces non-experts to take when they have to “defer epistemically to experts.” The first is substantive second guessing by the non-expert of the expert’s judgment. By this route, “the non-expert relies on his own substantive evaluation of the scientific evidence.” Brewer nicely points out that the more one substantively second-guesses, the less one can be said to defer epistemically.\(^73\) This may occur when the practical reasoner is approximately as learned in the particular area as the expert. According to Brewer, even when this is not the case, the American federal system seems to require that non-experts sometimes make “an epistemically substantive judgment about the merits of an expert’s proffered testimony.”\(^74\) Being “a high-profile culprit here,” \( D a u b e r t \) tends to cause judges, well sensing their epistemic incompetence, “to convert what is on the surface a substantive inquiry . . . into a form of deference based on demeanor and credentials.”\(^75\)

Brewer’s second way in which the practical reasoner can handle expert testimony, “even without training in the expert’s field,” is by discerning a self-contradiction or incoherence in that testimony.\(^76\) In this way, the non-expert uses what Brewer calls “[g]eneral [c]anons of

\(^73\) Brewer, supra n. 13, at 1616.
\(^74\) Id. at 1617 (emphasis added).
\(^75\) Id. at 1618. This is where Brewer purports to substantiate his claim by citing a single case, \( Z u c h o w i c z v. U n i t e d S t a t e s \), which emphasized the general acceptance test mentioned in both \( D a u b e r t \) and \( F r y e \). Id. (citing \( Z u c h o w i c z v. U . S . \), 870 F. Supp. 15 (D. Conn. 1994)).
\(^76\) Id.
[r]ational [e]videntiary [s]upport.”\textsuperscript{77} For instance, where a medical witness testifies both that a person was “grossly psychotic” and “sane” at the same time,\textsuperscript{78} the ordinary juror can probably identify the contradiction. Brewer shows that such failures of rational coherence occur along an obscurity spectrum, the psychotic/sane example being minimally obscure and thus easiest to discern. Much more obscure, states Brewer, was the testimony of a statistician in the O.J. Simpson criminal case who had “failed to account for certain DNA characteristics in [critical] blood samples.”\textsuperscript{79} However, regarding this second route, Brewer “speculate[s] (and do[es] not claim greater certainty)” that non-experts are able to evaluate expert testimony according to the general canons of rational evidentiary support in “only a relatively small percentage” of cases.\textsuperscript{80}

Brewer is probably wrong here. He acknowledges that the O.J. Simpson statistician conceded his error under cross-examination,\textsuperscript{81} which was referred to by commentators and courts as “the greatest legal engine ever invented for the discovery of truth.”\textsuperscript{82} He also acknowledges that, when one side’s expert testimony is faulty, even obscurely, opposing counsel, “aided by his own opposing expert,” may be able to point this out to the fact-finder.\textsuperscript{83} If the stakes are high enough, and the particular issue important enough, each side will often have enlisted similarly sophisticated experts able to notice rational flaws. Indeed, as we will soon see, it is this very epistemic equality or near-equality of opposing experts upon which Brewer hinges much of his central thesis about epistemic arbitrariness in the courtroom. Moreover, it is important here that most of the Daubert factors, whether a scientific methodology has been tested, whether the theory’s been published and peer-reviewed, whether standards inform the technique, and whether the expert community supports the method,\textsuperscript{84}

\begin{itemize}
\item \textsuperscript{77} Id.
\item \textsuperscript{78} See People v. Palmer, 543 N.E.2d 1106, 1107 (Ill. App. Ct. 2d Dist. 1989).
\item \textsuperscript{79} Brewer, supra n. 13, at 1620 (citing D.H. Kaye, The DNA Chronicles: Bad Numbers, Good Lawyering, and a Better Procedure (Sept. 26, 1995) (available in 1995 WL 564589)).
\item \textsuperscript{80} Id. at 1620-21.
\item \textsuperscript{81} Id. at 1620.
\item \textsuperscript{83} Brewer, supra n. 13, at 1621.
\item \textsuperscript{84} Daubert v. Merrell Dow Pharm. Inc., 509 U.S. 579, 593-94 (1993).
\end{itemize}
are calculable by applying "general canons" of rational and empirical thinking.

Brewer’s third route for assessing expert testimony is by evaluating the expert witness’s demeanor.\textsuperscript{85} Aristotle similarly says the orator must “make his own character look right and put his hearers, who are to decide, into the right frame of mind.”\textsuperscript{86} One should agree with Brewer that assessing demeanor is not likely, in general, to explain how a non-expert can acquire JTB, or KJB, from an expert.

This leads to the fourth inquiry and, for Brewer, a “most important device” by which law explains “how practical epistemic deference can yield KJB.” According to Brewer, the law assumes that non-experts can accurately assess experts and competing experts by their credentials.\textsuperscript{87} This points the way to what Brewer calls “the underdetermination problem,” which is the linchpin of his arbitrariness argument. If credentialism is the main way non-experts are able to evaluate expert testimony, then any problem inhering in that method magnifies onto the evaluation. Brewer explains the underdetermination problem this way:

When the credentials of the experts are, to the eyes of the non-expert, evenly matched for all the non-expert justifiably believes—that is, when they underdetermine the credibility of the competing witnesses—it is very difficult to see how credentials could provide an epistemically legitimate method the non-expert can use to resolve selection and competition problems.\textsuperscript{88}

Brewer claims that:

According to a moderate skepticism, judgments about experts’ scientific propositions will be arbitrary at least when the following condition is satisfied: Whenever the criterion of credentials underdetermines what scientific proposition is endorsed—that is,

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\textsuperscript{85} Brewer, supra n. 13, at 1622.


\textsuperscript{87} Brewer, supra n. 13, at 1624.

\textsuperscript{88} \textit{Id.} at 1630. “Selection” problems include determining which intellectual enterprise is a science, “determining who is a scientist capable of using her science in a manner that [meets] the standard of epistemic appraisal,” determining which science is relevant to the case, and so forth. “Competition” is the problem of “rationally decid[ing] which of the competing experts . . . to believe” on a scientific issue. \textit{Id.} at 1625.
when two roughly equally well-credentialed experts (to the eyes of the non-expert) endorse competing propositions, either about scientific theory, about scientific method, or about the application of scientific theory and method to a particular case.89

Under the stronger brand of skepticism Brewer endorses, a non-expert faced with competing and roughly equally well-credentialed experts (satisfying the underdetermination condition) “will on average do no better in selecting which scientific expert to believe than one would by tossing a coin,” and any true belief the non-expert manages to acquire must be presumed accidental and thus not justified.90 Conceding difficulties of estimation, Brewer posits that the underdetermination condition is “clearly” satisfied in “a very significant percentage” of litigated cases.91

This underdetermination argument is the centerpiece of Brewer’s thesis. He highlights it, once again, in his conclusion as the main reason non-expert legal actors trying to evaluate scientific testimony are “in a great many instances, not capable of performing in an epistemically non-arbitrary manner.”92 Notwithstanding Brewer’s eloquence, underdetermination as a source of arbitrary decision making does not amount to much.

First, the underdetermination argument should not be relevant to the Daubert gatekeeping obligation. The court’s role is not to weigh competing or even contradictory theories, methods or applications, but simply to determine the threshold issue of admissibility at the evidentiary front gate.93 Each scientific expert proffer is evaluated on its own methodological merits. Daubert cautions that “[t]he focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.”94 Here, it is unnecessary to consider meta- and meta-meta-scenarios, in which the litigants at the Daubert hearing present not only competing primary experts, but also competing secondary experts assessing the primary ones, and competing tertiary experts evaluating those. That is not what Brewer has in mind. He is speaking of the “very significant percentage” of

89. Id. at 1669 (emphasis added).
90. Id. at 1670-71.
91. Id. at 1669-70.
92. Id. at 1680.
cases in which experts compete, for example, to "provide[] the best explanation of a particular incident."95

Brewer is really concerned with underdetermination, hence arbitrariness, in the fact-finding process. But here, the underdetermination argument proves too much. If it were credible, then in any case, regardless of whether expert proofs were involved, a rough equivalence (in the fact-finder's eyes) of persuasive evidence for each side would entail arbitrary decision making, nothing better than the "tossing of a coin."96 So if there is a legal mechanism that handles such a circumstance generally, there may be no reason why it would not handle Brewer's underdetermination circumstance.

That mechanism is the burden of proof. During the course of a trial, the parties have burdens of production on each issue, sometimes those burdens shift from one party to the other, and one party at all times carries an ultimate burden of persuasion.97 There is no reason to suppose underdetermination leads to an arbitrary resolution. Quite the contrary, jurors in every trial, civil or criminal, are instructed that a particular party bears the burden on each material issue or in the action generally, and that unless that party has met its burden (whether the standard be "more likely than not," "clear and convincing," or "beyond a reasonable doubt") the jury must find for the other party.98 A

95. Brewer, supra n. 13, at 1670 (emphasis added).
96. Actually, a jury in Kentucky did toss a coin recently as its method of finding the defendant guilty of murdering his girlfriend. Since that is improper, the judge declared a mistrial and set the verdict aside. Toby Harden, Retrial After Jurors Toss Coin to Find Man Guilty of Murder, The Daily Telegraph (London) at 18 (Apr. 26, 2000). For the purposes of this article, the author ignores the incident, as would Professor Brewer.
97. As one court explained:

"Burden of proof" is an amorphous term, comprising both the "burden of production" and the "burden of persuasion," . . . Thus, the burden of production is not forever on one party; rather, it is an evidentiary tool that shifts from one party to another. It is the burden of persuasion that rests at all times with the plaintiff.

In re Lewis, 845 F.2d 624, 634 (6th Cir. 1988) (citation omitted).
98. The standard "more likely than not" is met when the party with the burden of persuasion establishes the elements of its case by a preponderance of evidence, which occurs when the fact-finder is satisfied that the fact is more likely true than not true. See Lopinto v. Haines, 441 A.2d 151, 155 (Conn. 1981); Masaki v. Gen. Motors Co., 780 P.2d 566, 574 (Haw. 1989); Riley Hill Gen. Contractor, Inc. v. Tandy Co., 737 P.2d 595, 601-02 (Or. 1987). Clear and convincing proof is an "intermediate standard of proof greater than a preponderance of the evidence, but less than proof beyond a
seeming tie always favors the party without the burden. There is nothing arbitrary about this scheme. Yet Brewer only mentions "burden or proof" or "burden of persuasion" four times, each time without discussion and merely in iteration of a particular court's holding.99

Brewer's use of underdetermination is not the only aspect of his article that may work to undermine his thesis. Notwithstanding his view that the non-expert faces practically insurmountable difficulties aspiring to JTB or KJB with regard to scientific proof, Brewer advocates what Keith DeRose has called a "high octave" epistemology,100 demanding not just knowledge but a sort of coherentist understanding. Entailing "a widening, explanatory, synoptic grasp,"101 understanding as an approach certainly furthers Brewer's skepticism. Borrowing from Neil Cooper, he explains "it is possible to have knowledge of a bitty or superficial kind, while we only have understanding when we relate or connect bits of knowledge with other bits in a more or less coherent whole."102 And Brewer quotes approvingly from Catherine Elgin's "more ambitious project" that "understanding is far more comprehensive than knowledge ever hoped to be."103

Applied to legal decision making, Brewer's defining of epistemic competence in terms of understanding not only fosters skepticism, but

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99. See Brewer, supra n. 13, at 1551 n. 67 (mentioning a passage from the remanded case of Daubert v. Merrell Dow Pharm., Inc., 43 F.3d 1311 (9th Cir. 1995)), 1552 (quoting twice from the Daubert opinion), and 1556 n. 86 (regarding Davis v. County Sch. Bd., 103 F. Supp. 337 (E.D. Va. 1952)).


101. Brewer, supra n. 13, at 1591-92 (citation omitted).

102. Id. at 1592 n. 218 (quoting Neil Cooper, Understanding, 68 Proc. Aristotelian Soc'y. 1, 3-4 (Supp. 1994)).

103. Id. (quoting Catherine Z. Elgin, Considered Judgment 123 (1996)); cf. Linda Zagzebski, What is Knowledge?, in The Blackwell Guide to Epistemology 92, 110 (John Greco & Ernest Sosa eds. 1999) (proposing a virtue theory of knowledge, virtue being "an admirable quality that goes beyond the minimum for being epistemically respectable").
also overshoots the area of scientific opinion testimony and threatens to
discount nearly the entire fact-finding enterprise. In rat-a-tat fashion,
he makes a very reasonable point, and then a possibly disastrous one:

To have epistemic competence in [an expert] discipline is, I
suggest, to be capable of grasping and manipulating this kind of
reticular structure of aims, methods, and factual judgments in an
expert discipline. \textit{It is precisely the lack of this kind of
understanding in non-expert legal reasoners that casts doubt on
their capacity to rely legitimately on expert scientific testimony in
reaching practical decisions.}\textsuperscript{104}

This assessment rebels not just against \textit{Daubert}, but against Rule
702 itself, which allows into evidence “scientific, technical, or other
specialized knowledge [that] will assist the trier of fact to understand
the evidence or to determine a fact in issue….”\textsuperscript{105} More
significantly, legal cases routinely incorporate myriad forms of
moderate expert or technical proof in relation to which legal reasoners
would usually fail to meet Brewer’s “grasp and manipulate” test.

For example, cases will include technical testimony about the
particular details of a police investigation, medical testimony about the
tort plaintiff’s injuries, or economic testimony about the loss of a
party’s earnings or the valuation of her property. In few instances
would ordinary fact-finders be epistemically qualified to “grasp[] and
manipulat[e] this kind of reticular structure of aims, methods, and
factual judgments” in the respective discipline.\textsuperscript{106} Yet no reasonable
critic has ever doubted their capacity to rely legitimately on such
testimony in reaching practical decisions. By the same token, judging
legal entitlement to the Wolfskehl Prize is not the same as judging
mathematical precision in proving Fermat’s Last Theorem.

Finally, what is Brewer’s solution to the epistemic crisis in the
courtroom? If legal fact-finders passing on scientific testimony ought
to have understanding enough to grasp and manipulate, that is, to do
the science, then those fact-finders ought themselves to be scientists.
Brewer’s “two-hat” solution aspires to effectuate “the practical norm of

\textsuperscript{104} Brewer, \textit{supra} n. 13, at 1592-93 (omitting Brewer’s emphasis upon first
sentence, adding emphasis upon second).

\textsuperscript{105} Fed. R. Evid. 702 (emphasis added).

\textsuperscript{106} Brewer, \textit{supra} n. 13, at 1592.
intellectual due process.”¹⁰⁷ This includes “turning over many decisions currently made by private litigation to public administrative agencies staffed with trained scientists, relying on blue ribbon scientifically trained juries, scientific expert magistrate judges, or even special science courts staffed by scientifically trained judges.”¹⁰⁸

Brewer’s two-hat proposal draws heavily on one extreme 1980 litigation, In re Japanese Electronic Products Antitrust Litigation, in which the Third Circuit questioned whether there may be a due process “complexity exception” to the Seventh Amendment right to jury trial under the United States Constitution.¹⁰⁹ The caption alone, joining well over a dozen electronics corporations as appellants, leaves the reader dreading what he or she knows will be mountains of technical, small-type proofs. But the caption is barely indicative of what lays beneath—the case involved two consolidated suits identifying about 120 antitrust co-conspirators, and counterclaims identifying dozens more.¹¹⁰ The appeal to the Third Circuit occurred after nine years of discovery had already produced “millions of documents and over 100,000 pages of depositions.”¹¹¹

In the particular context of the record before it, the court in Japanese Electronic made the following observations: That a suit may be “too complex for a jury when circumstances render the jury unable to decide in a proper manner,”¹¹² that “[a] jury that cannot understand the evidence and the legal rules to be applied provides no reliable safeguard against erroneous decisions,”¹¹³ and that “due process precludes trial by jury when a jury is unable to perform this task with a reasonable understanding of the evidence and the legal rules.”¹¹⁴ The court warned, however, that district courts had very little discretion to deny jury trials, and that any such rulings “should be confined” to those very few suits whose complexity is “so great,” as determined by “a
high standard,” that it is beyond the jury’s ability to decide rationally.115

*Japanese Electronic*’s self-announced applicability to a very few highly complex cases is a far cry from Brewer’s two-hat solution to be applied in “many” cases.116 Further, as Brewer concedes, none of the analysis in *Japanese Electronic* concerned the possibility of a blue-ribbon or expert trier of fact.117 In one part, the court considered the traditional jurisdictional distinction between law (right of jury trial) and equity (chancellor’s jurisdiction),118 and the issue in the opinion was only whether the non-expert jury or the non-expert judge should find facts.119 Moreover, the Third Circuit’s rationale has been “infrequently followed” if at all,120 and Brewer, writing nearly twenty years later, cites no further applications.121

Nor does Brewer mention (not that he was obliged to) the Federal Circuit’s retort to *Japanese Electronic* in the complex patent infringement suit of *SRI International v. Matsushita Electric Corporation of America*.122 There, the court emphasized that “[t]he call for injection of ‘expertise’ into our jurisprudence can be as alluring, and as fatal, as the sirens’ song.”123 The court dismissed the suggestion of one commentator, echoed by Brewer, “that the ‘complexity exception’ should encompass the court’s, ‘for ‘specialized’ courts limited to decision making solely on

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115. *Id.* at 1088.
117. *Id.* at 1676-78.
119. *Id.* at 1071.
121. Brewer refers to subsequent analogous language only in the complex technical patents case of *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996), in which Justice Souter said that “a trained ability,” i.e. the judge’s ability, “to evaluate the testimony in relation to the overall structure of the patent” may be more significant than the jury’s evaluation of demeanor or its reflection of community standards. *Id.* at 390.
122. 775 F.2d 1107 (Fed. Cir. 1985).
123. *Id.* at 1129.
124. *Id.* at 1128.
technological considerations."

In all events, the reasoning of SRI International was mainly that Japanese Electronic flouts "the clear directive of the Seventh Amendment—that 'the right to jury trial shall be preserved.'"

IV. LAW'S EPistemology

The discussion of Japanese Electronic and SRI International suggests that Brewer's epistemology is not law's. Daubert scholars, Brewer included, have erred in failing to appreciate the opinion's contextualism, and in taking law's encounter with science to be subsumed within the separate scientific enterprise. An important indicator is the sense in which Daubert scholarship usually seems off—sometimes bizarre. In other words, scholars' invariantist presupposition tends to build into their arguments an unintended (and unappreciated) reductio ad absurdum.

In this part of the article, it will be argued that contextualism nicely explains law's epistemology because it is a good theory of knowledge generally. This theory, however, has received no rigorous treatment, and virtually no mention at all, in any of the legal scholarship.

A. THE INVARIANTIST ASSUMPTION

1. Frye's Coherentism and Naturalism

An important part of the problem with Brewer's analysis, and with the similarly critical post-Daubert scholarship generally, is its lack of a contextualist perspective, plus the attendant implicit assumptions that 'knowledge' must be invariantly defined and that law incorporates this invariantism. While Frye did not embrace invariantism, it appeared to do so because its defining language is best read as

125. Id. at 1129.
126. Id. at 1127 (emphasis added).
128. But cf. James Boyd White, From Expectation to Experience: Articles on Law and Legal Education 84 (U. of Mich. Press 1999) (suggesting a relativist version of a sort of contextualist theory of meaning, saying "the array of contexts by which my terms and phrases and gestures have acquired their meaning are different for you and for me").
coherentist and/or naturalist, either of which is ordinarily seen as invariantist.

Language in *Frye* readily interpreted as coherentist includes the following: “expert testimony deduced from a well-recognized scientific principle or discovery” is admissible so long as “the thing from which the deduction is made [is] sufficiently established to have gained general acceptance” in the particular scientific community. 129 The epistemological issue framed by this assertion is essentially whether the proffered expert testimony *coheres* with the belief system of the relevant scientific community.

As Jonathan Dancy reports, consistency and completeness of beliefs are not enough to render a belief system coherent. A third element is needed. Classical coherentism uses the notion of entailment: *p* entails *q* if, given *p*, *q* must be true. 130 In other words, members of a set of beliefs must be entailed by the other members in order to cohere. Some coherentist philosophers have said, however, that entailment is not good enough because it fails to account for the way expanding our belief system makes it better, or more coherent. As a result, Wilfrid Sellars and Keith Lehrer speak of “explanatory coherence”—as the set grows each member should be better explained by the rest. 131 But Dancy argues that the mutual explanation element is entailment in another guise. Saying *p* explains *q*, we say *q* should be true, given *p*. “Explanation thus reveals entailment, in Blanshard’s sense.” 132 Moreover, there is no reason an entailment link cannot be a matter of degree, a richer belief system strengthening the links.

*Frye*’s test requires not only consistency but also explanatory entailment. 133 When the expert shows he “deduced” his testimony

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132. Dancy, *supra* n. 130, at 237.

133. *Id.* (stating the completeness requirement “can be quietly dropped,” because searching for a higher degree of mutual explainatoriness already accounts for this element). In any event, there is no really clear notion of completeness available in this context.
from a generally accepted or well-recognized scientific principle, he shows that, given the principle \( p^* \), his testimony \( q^* \). He thus explains \( q^* \) by appeal to \( p^* \), and his fulfilling the Frye standard becomes a coherentist exercise.

On the other hand, when a court asks whether the underlying scientific principle has “gained general acceptance” in the relevant community, it is triggering an empirical investigation into that community’s psychological and cognitive mechanism for arriving at intersubjective beliefs. Sensory input causes perception neurologically, and the passage from perception to generalization and systematization is psychological.\(^\text{134}\) The inquiry may not delve too deeply, if at all, into the belief-generating process, but it does seek out the psychological facts of acceptance and recognition. As such, this approach to the knowledge issue is naturalized, and Frye places the court scrutinizing proffered novel scientific testimony in the role of naturalized epistemologist.

If this were all there was to Frye—its coherentism and its naturalism—there would be little reason not to conclude it incorporated an invariant concept of “knowledge.” The legal issue would then be solely whether, by the lights of his professional community, the expert had attained knowledge. The court’s job would be to ask whether the witness’s beliefs cohered with the community’s, and to answer this question empirically using the general acceptance test. Indeed, Frye seems to contemplate just such an invariantist scheme. This is not to say that the court had epistemology, or any particular epistemological doctrine in mind. Rather, the legal issue it addressed naturally invites epistemological analysis, and the language of its legal rule fits with invariantist thinking. Accordingly, legal scholars cannot be faulted for assuming law’s invariantist approach. After all, mainstream epistemology has always made the same assumption.

Superficially, either the proffered witness knows or does not know. The court can effectively relinquish its decision-making authority on that issue and look to the scientific community for an answer. This was not of importance when the District of Columbia Circuit issued Frye, because that ruling concerns a very small legal evidentiary area, namely, novel scientific proofs.\(^\text{135}\) In the years since Congress announced the Federal Rules of Evidence, however, novel

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scientific proof has become outcome determinative in a growing number of substantial litigations, and scientific and technical evidence generally plays an important role in most cases. If invariance is right, and if law’s epistemology mirrors philosophy’s theory of knowledge, then maybe scientists should replace non-expert judges in “a very significant percentage” of litigated cases.136

The argument, however, is that Frye likely does not incorporate an invariantist approach to knowledge. On the one hand, controversy concerning novel evidence was the context that activated Frye’s coherentism and naturalism. On the other hand, a legal finding of general acceptance is not necessarily the same as a scientific finding of ongoing validity or usefulness. As Justice Blackmun explains in Daubert, scientific conclusions are revisable, but law has to resolve disputes now.137 Front-end spectral assessment based on Fourier analysis may provide generally accepted (hence, legally admissible) methodologies for speech recognition, yet suffer from weaknesses increasingly deemed unacceptable in the scientific literature.138

2. Naturalized Coherentist Contextualism—Overlap

Daubert enables us to see, better than Frye could, that law’s epistemology is contextualist. Daubert’s scheme, with Rule 702 as its point of departure, is more obviously inconsistent with invariantist doctrine. At the same time, Daubert retains a robust naturalism, and coherentist principles, and applies these expansively to scientific testimony generally, both novel and otherwise.139

This implies that contextualism does not necessarily conflict with naturalism or coherentism. As DeRose says, contextualism is “consistent with either foundationalism or coherentism,” and there is no reason it cannot similarly allow for naturalist inquiry.140 This writing should be judged by the internal consistency and mutual explanatory power of its propositions, hence by the strength of its

139. This was later extended to technical and other expert proof. See Kunho Tire Co. v. Carmichael, 526 U.S. 137, 147 (1999).
140. DeRose, supra n. 100, at 190.
coherence. Likewise, it looks empirically to law’s cases, mechanisms, and praxis and thus might be seen as naturalized legal philosophy, even as it uses this naturalist procedure to support a contextualist thesis. Seeing ways in which coherentism and naturalized epistemology may each overlap with contextualism should help explain both how Daubert and Frye see ‘knowledge’ variantly even while incorporating coherentism and naturalism, and why legal scholars may have misconstrued Daubert’s contextualist features as the same old invariantism gone astray.

Before addressing the common ground, however, we should keep the obvious in mind: that coherentism and naturalized epistemology are not necessarily contextualist. Coherentists and naturalists may apply an invariant standard for attributing knowledge. Contextualists may judge coherence within a consistent and comprehensive set of statements as insufficient to justify beliefs. Nor may they, unlike naturalists, have any special reason to object to a priori assertions of a statement N, although whether they will say “S knows N” may involve shifting epistemic standards. Contextualists might not object, for instance, to Hans Lenk’s argument that some logical rules must be immune to revision a priori because they analytically inhere in the very criticism that would reject them.141 As Karl-Otto Apel explains, “Lenk attempts to establish as complete a list as possible of these rules by reflecting—as I would interpret him upon what aspects of logic one cannot reject without having recourse to them—in the sense of a petitio tollendi—in the critique itself.”142 Is not the naturalist’s rejection of a priori reasoning itself an armchair assessment? The better issue to grapple with is the contextualist one —whether the truth condition, or merely the condition of warranted assertability, may vary in varying contexts for the proposition “S knows that p.”

That being said, it is evident that there are a number of areas of compatibility between the three theories of knowledge discussed herein, including (1) a rejection of classical epistemology, (2) an important role for communities of epistemic agents, (3) the requirement

that the propositions we know be consistent, (4) the empirical investigation of contexts, and (5) fallibilism.

Regarding the first, Ernest Sosa opines that “[c]ontemporary epistemology must choose between the solid security of the ancient foundationalist pyramid and the risky adventure of the new coherentist raft.”143 The coherentist argument against foundationalism, as Sosa puts it, is as follows: if mental states incorporate propositional attitudes, they do not connect us directly to pure experience, unfiltered by prior concepts and beliefs. Not giving us direct contact with reality, mental states provide no guarantee against error, and cannot serve as a foundation for knowledge. On the other hand, if mental states do not incorporate propositional attitudes, they cannot provide logical support for one hypothesis over another, and thus also cannot serve as a foundation for knowledge. Since every mental state either does or does not incorporate a propositional attitude, no mental state can serve as a foundation for knowledge.144 The merits of this argument are not relevant here.

On the naturalist side, Quine’s Epistemology Naturalized views classical epistemology as the “Cartesian quest for certainty . . .”145 “[B]ut that quest was seen as a lost cause. To endow the truths of nature with the full authority of immediate experience was as forlorn a hope as hoping to endow the truths of mathematics with the potential obviousness of elementary logic.”146 Expressing foundationalism’s failures is not ground-breaking, but nor, says Quine, did Carnap’s “heroic efforts” succeed on the conceptual side of epistemology. Carnap’s Cartesian-like project in Der Logische Aufbau der Welt was to promote a translational point-to-point reduction of physical terms and terms of theoretical science into terms of observation, logic, and “set theory,” thereby deductively validating science from indubitable sense experience.147 But under Quine’s view that empirical meaning is generated by experience holistically, each statement facing “the tribunal of sense experience not individually but only as a corporate

144. Id. at 190-91.
146. Id. at 256.
147. Id.
body,” the sort of reduction Carnap wanted could not in principle be attained.148

Contextualism similarly flows out of the perceived failure of classical foundationalist approaches to the theory of knowledge, although contexts may vary pluralistically for individuals, and so this sort of holism need not be assumed. “Understanding what a whole φ is involves understanding what will count as a part, and this will vary with context.”149

David B. Annis summarizes the main objections to foundationalism: (a) the denial of “basic beliefs” arising from certain indubitable perceptions and experiences, and (b) the claim that, even if there were these beliefs, these would be few and far between and constitute only an “impoverished” foundation for the rich body of statements we ordinarily believe to be justified.150 For Annis, foundationalism overlooks “contextual parameters essential to justification.”151 David Lewis, an externalist contextualist, says ascriptions of knowledge, like much of what we say, are context-dependent, and that infallibilist epistemology (or even epistemology generally) is maybe “a context that makes them go false. Then epistemology would be an investigation that destroys its own subject matter . . . . In the strict context of epistemology we know nothing, yet in laxer contexts we know a lot.”152

From this we see that coherentism, naturalism, and contextualism all reject classical epistemology from various angles. That rejection


149. Robert J. Fogelin, Pyrrhonian Reflections on Knowledge and Justification 208 (Oxford U. Press 1994); see Ludwig Wittgenstein, Philosophical Investigations 22” (2d ed., G. Elizabeth M. Anscombe trans., Blackwell Publishers 1997) (“If I tell someone without any further explanation: ‘What I see before me now is composite,’ he will have the right to ask: ‘What do you mean by “composite”?’ For there are all sorts of things that can mean!—The question ‘Is what you see composite?’ makes good sense if it is already established what kind of complexity—that is, which particular use of the word—is in question.”).


151. Id.; but see DeRose, supra n. 100, at 190 (calling Annis’s articulation of contextualism “a form of foundationalism,” not a structural alternative).

also helps explain the important role for communities of epistemic agents ascribed by the three schools. Descartes closed his eyes, stopped his ears, and blocked all his senses while trying to understand what he knew. The certain thing was that he, and he alone, existed, but so long as he was thinking. “For it could be that were I totally to cease from thinking, I should totally cease to exist.”¹⁵³ A departure from foundational experience—which if construed broadly may include perception, consciousness, reflection and memory—gives meaningful room for social and institutional practices to play a role either in producing or inhibiting knowledge.

Dancy explains that coherentism has an advantage over classical epistemology because it does not egocentrically focus on the individual’s struggle to construct his own epistemology, a central feature of the classical enterprise. Instead, coherentism sees knowledge as a social phenomenon, something shared and increased by sharing. Other’s testimony enhances the coherence of one’s own belief-set, and we become epistemic collaborators.¹⁵⁴

Quine’s “observation sentences,” or Protokollsätze, are those “on which all speakers of the language give the same verdict when given the same concurrent stimulation.”¹⁵⁵ It makes sense, then, that what an observation sentence is will vary with the width of the community considered.¹⁵⁶ Quine says this intersubjectivist formulation “accords perfectly with the traditional role of the observation sentence as the court of appeal of scientific theories.”¹⁵⁷

Contemporary naturalists share a conviction in the logic of the social production of true belief. Knowledge is a natural phenomenon empirically investigated. In their optimistic posture, naturalists argue that social institutions, especially scientific ones, are structured to produce true belief; “they are not merely vehicles for the dissemination of belief of whatever sort or vehicles for the concentration and

¹⁵⁴. Dancy, supra n. 130, at 241 (citing Nicholas Rescher, The Coherence Theory of Truth (Clarendon Press 1973)).
¹⁵⁵. Quine, supra n. 145, at 262.
¹⁵⁶. Id. at 262-63.
¹⁵⁷. Id. at 262.
perpetuation of political power . . .”158 W.V. Quine and J.S. Ullian say truthfulness, most primitively manifesting in the link between observation sentences and appropriate sensory stimuli, is essential to language’s very survival.159 Also, the capability to predict accurately is usually critical to social groups, and success in doing so is a measure of true belief. The legal decision in Frye, and to a large extent in Daubert, is predicated on the optimistic naturalist view of scientific institutions.

The epistemic community also plays a central role in Annis’s internalist articulation of contextualism. Annis adopts a Peircian conception of justification, the test being whether the purported knower S is able to meet all current objections raised by the community of truth-seekers, to the extent that such objections express a real doubt.160 A doubt is real when, according to John Dewey, it “jars, hitches, breaks, [or] blocks . . .”161 A paper doubt, on the other hand, is one assigned a low probability by S’s objector group. Cartesian demon and dream scenarios are assigned a de minimis probability. Annis’s foundationalist aspect appears when he allows for contextually basic beliefs. These are beliefs for which the appropriate objector group does not require S to give reasons.162 The set of foundationalist basic beliefs should be a subset of the contextually acceptable ones—at least for those beliefs the community will not require justification.

While the non-foundationalist schools thus posit social mechanisms by which true beliefs arise and constitute knowledge, each, in its more pessimistic posture, allows for the possibility that institutions may impair the production of true belief. Philip Kitcher, for instance, is not optimistic that the existing social structures of

158. Hilary Kornblith, Naturalistic Epistemology and Its Critics, 23 Phil. Topics 237, 245 (Spring 1995); see generally Alvin I. Goldman, Liaisons: Philosophy Meets the Cognitive and Social Sciences 112-21 (MIT Press 1992); Philip Kitcher, The Division of Cognitive Labor, 87 J. Phil. 5 (1990); see Daniel C. Dennet, Intentional Systems, 68 J. Phil. 87, 97 (1971) (discussing “the contingent, empirical (but evolution-guaranteed) fact that men in general are well enough designed both to get the answer right and to want to get it right”); Philip Kitcher, Socializing Knowledge, 88 J. Phil. 675 (1991).
161. Dewey & Bentley, supra n. 11, at 315.
162. Annis, supra n. 150, at 216.
science would be "vindicated by an optimality analysis." But he uses that sort of analysis to demonstrate several ways one might calculate optimal assignments of cognitive labor to rival scientific methodologies. Kitcher's work shows how social structures generally operating within the scientific community "can work to the advantage of the community epistemic projects . . . ." 

Empirically, it would be fair to say that social and scientific institutions are ordinarily capable of creating, administering, and adhering to social mechanisms that reliably produce true belief when the institution wants to do so. Self-interest and survivalist considerations may, on occasion, lead them systematically to foster false belief. For example, Johns-Manville Corporation's President admitted that his company, though staffed with a sophisticated scientific and medical division, fostered the false belief among employees that their asbestos production work was safe, intending to "let them work until they dropped dead" because "we save a lot of money that way." In the contextualist scheme, it is a community of uncoerced, uncorrupted truth seekers who are charged with raising relevant objections. Failure to satisfy this condition means not ruling out real-world Manville-like contexts.

Thus far, this article has demonstrated that coherentism and naturalism share with contextualism a rejection of classical epistemology, and all three of these schools ascribe an important role for communities of epistemic agents. The third area of overlap is simply the requirement that the propositions we know be consistent. An important criticism of coherentism is that consistency is not sufficient for justification, not that it is not necessary for knowledge claims. If knowledge is JTB, S cannot know a set of sentences $\Gamma$ when

163. Kitcher, The Division of Cognitive Labor, supra n. 158, at 22.
164. Id. at 21; see generally Alvin I. Goldman, Foundations of Social Epistemics, 73 Synthese 109, 109-44 (1987); Kitcher, Socializing Knowledge, supra n. 158, at 675 (opining that even while conservatively retaining a traditional account of knowledge, one can show "knowledge is socialized by recognizing the need to understand those social institutions which promote the well-groundedness of individual belief.").
165. Deposition of Charles H. Roemer, Johns-Manville v. U.S., 13 Cl. Ct. 72 (testifying to conversation with Vandiver Brown, General Attorney and President, Johns-Manville Corporation). If "institution" or "community" is taken to refer to whole industries, there is evidence that asbestos companies, just to stick to this type of example, fostered false beliefs in concert industry-wide. E.g. Dunn v. Hovic, 1 F.3d 1371 (3d Cir. 1993); Dartez v. Fibreboard Corp., 765 F.2d 456 (5th Cir. 1985).
166. See Annis, supra n. 150, at 213.
it is not possible for all members of \( \Gamma \) to be true. In logic's language, both \( P \) and \( \neg P \) would be derivable from that inconsistent set \( \Gamma \). A naturalist deriving contradictory empirical results knows that he does not know and that he must revise. If he is Quinean, he will revise background tenets rather than junking hypotheses or broad laws.\(^{167}\)

There is some support for the claim that contextualism permits relativism, hence \( P \) & \( \neg P \). S's local objector group may judge his evidence sufficient to establish \( P \), while T's group may say the same of \( \neg P \). Then too, New Jersey may be "flat" by a giant's lights, not "flat" by mine, or the room may be empty according to S thinking of furniture, not empty for T considering light bulbs and molecules.\(^{168}\) But none of this demonstrates a breakdown in consistency. Quite the opposite: there is a logical requirement that, \textit{mutatis mutandis},\(^{169}\) knowledge claims arising in equivalent evidential contexts be consistent. This requirement makes us conclude that apparent inconsistencies are actually contextual shifts in standards for knowing. Contextualism does not defy logic or common sense. The room really is both empty and not empty, but only relative to differing epistemic contexts. S and T may be concerned with furniture and molecules respectively, and thus arrive at \( P \) and \( \neg P \), but they cannot truthfully do so each thinking of furniture.

In other respects, if two individuals are equally capable and perceive the same evidence, albeit from culturally dissimilar vantage points, their conflicting perceptual claims should raise real Peircean doubts at some point. Suppose, for instance, L's community, being of the "line" culture, believes the Euclidean precept that the shortest distance between two points is a straight line. C, however, perhaps inculcated within a sort of Riemannian community, believes the same of the curve. L and C, each laypersons, are shown A——B, and state contradictory propositions about it. Intergroup interaction, evolutionary needs, or other doubt-raising mechanisms should engender an ultimate consensus. As Annis explains, epistemic

\(^{167}\) Quine, supra n. 134, at 18. This article does not discuss the issue of, or the debate over, Quine's ontological relativism. See Carl R. Kornig, \textit{Self-Reference and Philosophy}, 20 Am. Phil. Q. 207, 209 (1983).


\(^{169}\) "Since some things have changed others must change also." Russ VerSteeg, \textit{Essential Latin for Lawyers} 145 (Carolina Academic Press 1990).
practices aim at truth and avoidance of error. If L’s group’s practice is leading to \( P \), C’s to \( \neg P \), then one of the methodologies will ultimately emerge as unreliable for the group, engendering too many false perceptual beliefs.

More theoretically, a relativist reaction against consistency may say that for any \( p \), if \( p \) is true for A, there is a B for whom \( p \) is false. This relativist assertion will be referred to as \( R \). Because \( R \) claims absolute truth for itself, it is immediately self-contradictory. A less clipped view is that, under \( R \)’s rule, there must be some \( \hat{A} \), living in a different framework, for whom \( R \) is false, and thus for whom a proposition \( P^* \) (entailing \( \neg R \)) is absolutely true. If that framework is impossible, absolutism is negated absolutely, invalidating relativism. But if \( \hat{A} \)’s framework is possible, relativism is false in it, and, by relativism’s own standards, \( P^* \) is true in \( \hat{A} \)’s, hence in all possible frameworks.

Contextualism, which says that an individual’s knowledge claim is relative to his epistemic context, does not entail this sort of self-refuting relativism. Hence, like coherism and naturalism, it is compatible with a consistency requirement.

Overlapping factor four is the empirical investigation of contexts common to the three theories of knowledge. Of these three, naturalism most conspicuously relies on an empirical inquiry into epistemic contexts. Naturalist epistemologists want to study knowledge as a natural phenomenon, “not the concept of knowledge, but knowledge itself,” especially psychological mechanisms and social institutions. Quine’s epistemology “simply falls into place as a chapter of psychology and hence of natural science.” The experimental subject receives various stimuli as input, and as output says things about the world.

The relation between the meager input and the torrential output is a relation that we are prompted to study for somewhat the same

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170. Annis, supra n. 150, at 213, 216.
171. Id. at 216; Peirce, supra n. 160, at 130-31 (explaining that people “in the most priest-ridden states” realize “there is no reason to rate their own views at a higher value than those of other nations and other centuries; and this gives rise to doubts in their minds.”).
173. Kornblith, supra n. 158, at 244.
174. Quine, supra n. 145, at 260.
reasons that always prompted epistemology; namely, in order to see how evidence relates to theory, and in what ways one’s theory of nature transcends any available evidence.\footnote{175}

Empirical inquiry is compatible with coherentism, or at least it plays a controversial role. We usually insert our empirical findings into our belief set both to be tested, and as a standard against which to test existing beliefs. Coherentism has to work out how metabeliefs about empirical data may themselves cohere with sets of beliefs in the object language. It seems, though, that we do, and ought to, ascribe greater antecedent security to beliefs originating in our sense-world than in rumor or magazine stories, however consistent and inferentially viable the latter may seem.

In theory, we may subscribe to a pure form of coherentism that is linear and links beliefs deductively throughout the set. In practice, however, we routinely check novel beliefs by taking stock, empirically, of our existing inventory, not only those we may personally hold, but also relevant beliefs that are generally accepted in the world—hence Frye’s blend of coherentism and empiricism.

Similarly, in a contextualist setting, we appreciate contexts by investigating conditions in the world. Empirical questions have to be asked about possibilities ignored or eliminated, the circumstances and features of the knower’s and knowledge-attributor’s context, the perceptual apparatus (level of expertise) the knower brings to the situation, and what is at stake in making the knowledge claim.

Up to this point, this article has examined four overlapping features of coherentism, naturalism, and contextualism: (1) a rejection of classical epistemology, (2) an important social component, (3) consistency, and (4) a role for empirical inquiry. Our focus will now shift to the fifth feature—the fallibilist attitude characterizing each theory. Quine’s famous statement, which is arguably self-refuting, is that “no statement is immune to revision.”\footnote{176} As a counterpart, the \textit{Duhem-Quine} thesis argues against the notion of falsifiability adopted in \textit{Daubert},\footnote{177} explaining that “[a]ny statement can be held true come what may, if we make drastic enough adjustments elsewhere in the

\begin{itemize}
  \item \footnote{175} \textit{Id.}
  \item \footnote{176} Quine, \textit{supra} n. 148, at 43.
  \item \footnote{177} See text accompanying \textit{supra} n. 33.
\end{itemize}
system." In the holistic system of our knowledge and beliefs, with its meager input and the torrential output, experience underdetermines total science. A contrary experience does not falsify, but rather it affords us a wide set of choices about which statements to adjust. The scientific method, testability, authorizes rejection. The naturalistic philosopher believes, but tentatively so; she is "the busy sailor adrift on Neurath's boat." Empiricism's traditional efforts at rationally reconstructing, or at deducing, ontology from some pure form of sensory experience are abandoned. Our sensory receptors are objects at work in the streets, vulnerable to their bumps and potholes.

Philosophers have also used Neurath's metaphor in explaining coherency, seeing knowledge as "a raft that floats free of any anchor or tie. Repairs must be made afloat, and though no part is untouchable, we must stand on some in order to replace or repair others." Beliefs $B_1 \ldots B_n$ may cohere, but $B_{n+1}$ may entail patching or junking $B_1 \ldots B_n$. An interesting collateral question, one that does not need to be developed but is good to keep in mind, has to do with the subset of beliefs we are calling coherency, in theory as revisable or eliminable as any in favor of some other theory of knowledge. The issue recalls Quine's self-problematic articulation of global revisability.

Lewis well states a version of contextualist fallibilism. Infallibly, $S$ knows $p$ if and only if "$S$'s evidence eliminates every possibility in which not-$p$." But "Psst!" he says, an algorithm—a network of rules, sometimes in tandem, sometimes redundant, sometimes competing, one defeating another—allows us to ignore lots of possibilities. Characteristically, what is at stake controls a lot. In a high stakes criminal trial, even a lawyer's farfetched suggestion may create a reasonable doubt, as intended. But even when the defendant's life and liberty are at stake, some possibilities may properly be ignored. A reasonable juror will, in nearly all circumstances, ignore the possibility that a blackbird's song caused the trigger to release.

178. Quine, supra n. 148, at 43; see text accompanying supra n. 167.
179. Quine, supra n. 148, at 44.
181. Sosa, supra n. 143, at 190.
182. Lewis, supra n. 152, at 551.
183. Id. at 554-59.
3. Scholars' Invariantism

Invariantism has been the received epistemological view. Much about the defining legal decisions on the admissibility of scientific proof, especially Frye and now Daubert, resembles coherentism and naturalism, typically invariantist theories of knowledge. Since coherentism and naturalism overlap with contextualism in many ways, as just shown, and because Frye's contextualism is obscure, it is surprising neither that legal scholars would view Daubert through invariantist lenses, nor that they would take the discrepancy between Daubert's doctrine and a workable invariantism to reveal a failure of the Supreme Court's rule.

Brewer's two-hat proposal, that scientists decide legal cases, is not absurd in a naturalist world. Naturalism stands for the "rubbing out of boundaries"—philosophy becomes science, linguistics, law. Connections between metaphysics and epistemology reassert themselves, as when David Armstrong's materialism generates his reliabilism. The dialectic is that physicalist ontology tells us naturalized epistemology is true; naturalized epistemology tells us physicalist ontology is warranted, and "both of these claims are part of science itself and are, therefore, mutable and fallible." Put differently, physicalist ontology tells us our nerve endings connect us epistemically to the external world; naturalized epistemology tells us our epistemological enterprise, its psychological component, and natural science as a whole "is our own construction or projection from stimulations like those we were meting out to our epistemological subject." Quine later cautions that with this naturalism "does not

184. Quine, supra n. 145, at 264.
187. Roger F. Gibson, Jr., Translation, Physics, and Facts of the Matter, in The Philosophy of W.V. Quine 150 (Lewis Edwin Hahn & Paul Arthur Schilpp eds., Open Ct. Publg. Co. 1998). Note the apparent circularity in the view that naturalized epistemology both warrants the science and is a part of the science it warrants.
188. Quine, supra n. 145, at 261.
mean to [assert] that the things thus posited [or projected] do not exist.” 189

This brings us to a distinction Quine would have us make between indeterminacy of translation and underdetermination of ontology. Philosophers have confused the two, and a lot of post-Daubert scholarship is analogously confused. Gibson “fully understands” the distinction, and Quine “count[s] on the clarity of his presentation for a swelling of the ranks of those who get the point.” 190 That point is that, epistemologically, underdetermination of physical theory and indeterminacy of translation are on a par. Particular evidence will warrant alternative ontological theories; similarly, particular evidence will warrant alternative translations of a native expression. But the alternative ontologies, while evidentially supported, cannot all be true, nor all the worlds that may be intuited from the evidence real. “[A]lternative theories [may be] equally warranted by the same sensory evidence, [but it does not make] sense to say that they are equally true.” 191

The distinction comes down to this: there is a fact of the matter to physics, but not to translation. Quine says:

[T]wo conflicting manuals of translation can both do justice to all dispositions to behavior, and that, in such a case, there is no fact of the matter of which manual is right. The intended notion of matter of fact is not transcendental or yet epistemological, not even a question of evidence; it is ontological, a question of reality, and to be taken naturalistically within our scientific theory of the world. 192

Post-Daubert scholars, Brewer as well, err in sponsoring law’s loss of self by its immersion in science as science. “[T]he mistake of turning a ‘law and [discipline X]’ approach into a ‘law as (a subset of) [discipline X]’” approach arises from epistemic confusion. 193

189. Quine, supra n. 180, at 72.
191. See Gibson, Jr., supra n. 187, at 152.
193. Cf. Mike Townsend, Implications of Foundational Crises in Mathematics: A
case of law's interaction with science, scholars looking in as third persons on law's evidentiary scheme tend to succumb to pressure to discern the truth behind science's ontological theories. What they overlook is that fact-finders evaluate experts' alternative translations of science's expressions according to the legal standard imposed by the burden of persuasion, and not in the first instance as if they are resolving a scientific battle over competing ontological truths. While critical legal theorists speaking of the "legal culture" say "the meanings contained in legal doctrine are rigorously indeterminate and contradictory,"194 in a courtroom proffer of scientific evidence indeterminacy systematically favors the party without the burden.

At each point law's work is translational, and Quine shows that a set of proofs—not "proofs" in the metamathematical sense in which what is provable is true,195 but in the legal sense of proffered evidence—may justifiably, and reliably, warrant conflicting translations. James Boyd White puts it this way:

Law is a language that must establish relations with virtually all of the other languages spoken in our world: scientific and technical talk, psychological and sociological language, the speech habits of the parties and the witnesses, and so forth. The relationship is one of translation, for each of these other discourses is translated into the law.196

As a legal normative matter, law's structures are supposed to decide on the truth of alternative translations—or choose from competing scientific propositions advanced in the courtroom as probative with respect to some element of the cause of action—only by examining the persuasiveness of the evidence produced. The fact-finder's initial decision is a metadecision: he asks himself whether he knows enough to know. Assuming a simplified litigation involving one expert per side, if the answer to the metaquestion is "no," and if the

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issue is underdetermined in Brewer’s sense, the fact-finder decides for
the defendant, and this decision is not arbitrary.

Before the fact-finder is given that task, however, the court has to
rule on whether the expert himself knows, a threshold judicial decision
that is a function of whether the expert’s scientific or other evidence is
shown to reflect the fact of the matter reliably. If the scientist knows,
fact-finders who believe that knowing scientist themselves also know.
In law, fact-finders then know the thing that the expert avers is true,
even though the expert may not have specified the data or facts on
which he bases the opinion. Indeed, provisions such as Rules 703 and
705 of the Federal Rules of Evidence go a long way toward
demonstrating law’s implicit intent to contextualize knowledge claims.
These allow experts to testify to their opinions or inferences without
revealing the underlying facts or data, unless the court requires
otherwise or cross-examination forces the issue.197

Seeing law in an appropriate way, Brewer ought not be willing to
adopt drastic measures aimed at avoiding what he calls
“underdetermination” of experts’ credibility. Each side of the
controversy does its best to present its case and its translations, and
burdens of proof and the perceived reliability of evidentiary
mechanisms overcome indeterminacies. As Roger Gibson analogously
reports, “underdetermination of theory is a thesis belonging to
epistemology, not to ontology; it is a statement about evidence for
theory, not about truth of theory.”198 Legal justification is law’s
special province.

But what about truth? Have we not said that Rule 702 requires
that testifying experts have “scientific, technical, or other specialized
knowledge” that will assist the trier of fact, and do not the legal rules of
evidence seek first and foremost to promote the discovery of truth, not
only justified belief?199 Yes, but truth is uncertain even in the

197. Fed. R. Evid. 703 (2000) (prescribing that “[t]he facts or data in the particular
case upon which an expert bases an opinion or inference . . . if of a type reasonably
relied upon by experts in [that] field . . . they need not be admissible in evidence”); Fed. R. Evid. 705 (prescribing that “[t]he expert may testify in terms of opinion or
inference and give reasons therefor without first testifying to the underlying facts or
data, unless the court requires otherwise”); N.Y. C.P.L.R. 4515 (McKinney 1992)
(prescribing that an expert witness “may state his opinion and reasons without first
specifying the data upon which it is based”).
198. Gibson, Jr., supra n. 187, at 151.
scientific community, which is why there can be competing experts at all. In the 1920s and 1930s, only a few geologists advocated Alfred Wegener’s theory of continental drift in the face of seemingly rigorous geophysical proofs that masses of continental size could neither have moved so far nor preserved their outlines while doing so.\textsuperscript{200} David Lewis stresses, “[t]he serious business of science has to do not with knowledge \textit{per se}; but rather, with the elimination of possibilities through the evidence of perception, memory, etc., and with the changes that one’s belief system would (or might or should) undergo under the impact of such eliminations.”\textsuperscript{201}

The point is that evidence giving knowledge is graded. The question in the courtroom is how much evidence, and what sort, the expert has to talk about before the court may conclude that he knows. By seeming to hand the decision over to the scientific community, in effect, \textit{Frye appears} to require as much, and the same sort, as a scientist would require. This appearance promotes a view of the court as naturalized epistemologist. Its language tells the story of an emergent scientific epoch in which attributions of knowledge follow empirical and sensory guidelines. First, and just fortuitously, the case is actually \textit{about} the admissibility of a newly developed \textit{evidentiary} mechanism, the systolic blood pressure deception test. The mechanism’s proponents claimed that scientific experiments had shown that systolic blood pressure rises are caused “by nervous impulses sent to the sympathetic branch of the autonomic nervous system.”\textsuperscript{202} There is an epistemic theory and idea about the mind assumed by the science here, namely, that “truth is spontaneous, and comes without conscious effort, while the utterance of a falsehood requires a conscious effort,” reflected in nervous impulses and blood pressure.\textsuperscript{203}

While rejecting the device that day, the court on the face of its opinion accepts the third-person, empirical view of knowledge with regard to novel scientific testimony. The only question for the court in such circumstances, according to \textit{Frye}, is “general acceptance” of the

\textsuperscript{200} Martin Schwarzbach, \textit{Alfred Wegener: The Father of Continental Drift} 106, 108 (Carla Love trans., Science Tech., Inc. 1986); Kitcher, \textit{The Division of Cognitive Labor}, supra n. 158, at 7.

\textsuperscript{201} Lewis, supra n. 152, at 563.

\textsuperscript{202} \textit{Frye v. U.S.}, 293 F. 1013, 1013 (D.C. Cir. 1923).

\textsuperscript{203} \textit{Id.} at 1014.
scientific technique in the particular scientific field.\textsuperscript{204} The legal language translates to an empirical investigation of a psychological mechanism (acceptance) to determine whether the proffered testimony \textit{coheres} with the scientific community’s belief system. What is not obvious is that determining coherence is contextually variable. What is most obvious is \textit{Frye}’s pre-Quinean expression of naturalized epistemology. The court assigned itself the role of investigator, empirically determining the state of affairs in the scientific community, and, in appearance, intending its \textit{own rulings} to become a function of that external state of affairs.

The \textit{Frye} court’s abdication of its own agency would run counter to law’s rule. Courts have to act, and cannot “cease to face the world and instead become parts of it.”\textsuperscript{205} To sustain its unique function and to maintain the authority that flows from autonomy, the rule of law is vigilant not to give way to expert management based on social sciences, or, certainly, natural sciences. At the same time, though, courts benefit from insights derived from non-legal sources. \textit{Brown v. Board of Education} marshals psychological authorities explaining the effects of discrimination and enforced segregation.\textsuperscript{206} \textit{Roe v. Wade} mines historical medical texts to explain that the restrictive criminal abortion laws prevalent in 1973 were of “recent vintage.”\textsuperscript{207} But “insight into” is different from “management based on.” J. Harry Bennett’s being “[m]ightily pleased with this little insight into Spanish village life”\textsuperscript{208} does not imply a \textit{management} (oversight of a sort) \textit{based} on Spanish village life. When non-legal sources are intertextually latent or explicit in legal opinions, law is not extinguished as if by some legal realist maneuver.

So \textit{Frye} does create a tension between its apparent epistemological scheme and law’s rule. If \textit{Frye}’s rule tends to conceal its underlying contextualism, why has it remained the law in the federal courts until \textit{Daubert}, and in many state courts to this day?\textsuperscript{209} First, it has to be kept in mind that, properly applied, \textit{Frye} pertains only to a

\textsuperscript{204} \textit{Id.}
\textsuperscript{205} Thomas Nagel, \textit{The View From Nowhere} 114 (Oxford U. Press 1986).
\textsuperscript{206} 347 U.S. 483, 494 n. 11 (1954).
\textsuperscript{207} 410 U.S. 113, 129 (1973).
\textsuperscript{209} \textit{See e.g. People v. Wesley}, 611 N.Y.S.2d 97, 100 (N.Y. 1994).
very small portion of the scientific or expert proof presented in litigations. That is, Frye concerns only novel scientific evidence that a party proffers to prove an element of his case. Any perceived threat to the court's autonomy in one small area is de minimis. As a matter of efficiency, courts have always taken "judicial notice" of a certain class of facts, those well known and accepted in the world.\footnote{210}{See e.g., Murray v. Donlan, 433 N.Y.S.2d 184, 191 (N.Y. App. Div. 2d Dept. 1980).} By this, courts do not relinquish their agency and control over their affairs and opinions; they agree, albeit upon extralegal considerations, to a factual finding, as a matter of law, and thus without an evidentiary showing, in a well-defined and well-contained area of the litigation. But Rule 702 has to do broadly with "scientific, technical, or other specialized knowledge," and Brewer wants to replace the courts with blue-ribbon panels.

In the next section, this article will argue that contextualism best explains law's epistemology, and that Daubert represents, however implicitly, a significant philosophical clarification of that epistemology. Frye on a grander scale—Rule 702's scale—would go a long way toward reinforcing an invariantist view of the truth conditions of law's knowledge attributions. The judicial context of legal decision making would be more intractably obscured in setting the standard expert witnesses would have to live up to, and the pressing issues would be whether the experts lived up to pre-determined scientific standards, an empirical question, and whether their reasoning cohered with the prevailing scientific thinking. Why not have scientists resolve these issues?

While Brewer protests that Daubert requires courts to mutate into amateur scientists, the solution he proposes is that professional scientists replace courts. This thinking is the logical (and extreme) extension of what, on the surface, is Frye's (limited) epistemic scheme. But the Supreme Court rejected the proposition that the Federal Rules of Evidence "assimilated" Frye.\footnote{211}{Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 589 (1993).} In the next section, this article argues that, under the scheme adopted by Congress and in Daubert, what a court means when it says "expert S knows p" is different from what a scientific community means in making the same assertion about the same S and p.
Brewer, however, interprets Daubert's epistemology as invariant not contextualist. That is why the blue-ribbon idea makes sense to him. He is not alone, and the following articles contain similar interpretations.

Feldman, like Brewer a law professor and Ph.D. in philosophy, argues that Daubert's rule represents a "revised empiricist" philosophy of science, entailing a social, naturalized epistemology. She says this philosophy of science revises logical empiricism, which sees testability as "the sole distinguishing feature of science." Because revised empiricism emulates actual scientific practice, Daubert stresses not only testability, but also such factors as peer review, publication, and general acceptance as guidelines for identifying good science. Arguing that Daubert corrects Frye by ascribing to courts and juries a function "that reflects scientists' own approach," Feldman, anticipating Brewer, says, "if the evidence is to include any relevant science, it might make sense to use a jury of scientists."

Brian Leiter, yet another law professor/philosophy Ph.D., calls Feldman's view "a clever post-hoc justification of the test the Court set out," and says her philosophy of science could be right (although "realism" seems righter), but criticizes both Daubert's and Feldman's application of that approach to a philosophy of evidence. Discussing naturalized epistemology's focus on the social mechanisms involved in belief formation, Leiter comes closest to linking that theory to contextualism in the following statement:

If scientific knowers differ, as of course they do, from the "knowers" that comprise juries and that sit on the bench, then it should be surprising, from the perspective of naturalized epistemology, that the same norms for belief-formation should apply to both groups. Yet it is precisely this conclusion that Feldman appears to draw.

But rather than developing an epistemological theory that may explain variations in "knowers" arising from their contextual

212. Feldman, supra n. 53, at 10.
213. Id.
214. Id. at 10-15.
215. Id. at 2.
216. Id. at 6 n. 29.
217. Leiter, supra n. 44, at 808-12.
218. Id. at 805-06.
circumstances, Leiter remains within the naturalist framework, reducing knowers in the legal setting to “would-be” knowers. Thus, his argument is that “norms for belief-formation must be sensitive to the epistemic limits of would-be knowers: that is, the handicaps—intellectual, cognitive, temporal, material—that all real knowers operate under.”\textsuperscript{219} Leiter goes on to make a nice argument that \textit{Daubert} violates the “ought implies can” principle,\textsuperscript{220} and concludes that the ruling “makes unrealistic demands on the epistemic capacities of the adjudicatory process.”\textsuperscript{221}

Viewed contextually, Leiter’s point, like Brewer’s, would make good sense were a judge or juror expected to make scientific decisions binding on, or persuasive within, science itself. Then they would only be “would-be” knowers. The point, however, is less convincing in the context of legal decision making. In that context, the reasoner first decides whether the proffered expert witness knows. Under \textit{Daubert} the legal reasoner can do this without a scientist’s epistemic competence (Brewer’s “understanding”)—it is a question of scrutinizing the tell-tale signs, acceptability, peer review, testing, falsifiability. Then, if the witness knows, the legal reasoner can know what the witness conveys, again without “understanding” all of the ins and outs. A set of alternatives relevant to and eliminated by the scientist is merely logically possible for the adjudicator.

One may wonder here how a lay judge or fact-finder can determine whether factors such as testing or falsifiability have been satisfied without understanding the science. The answer is that these are meant to be precisely the sorts of facts many lay persons can determine. If the question is, “Has this been tested?,” “Has this been peer-reviewed?,” or “What do others in your (or the expert’s) field think about your (or his) methodology,” an expert can respond and a judge can process that response without much difficulty. In this vein, one commentator interprets Popperian falsifiability to entail “a conception of the scientific method that people standing outside of science could apply to determine whether purported scientists are in fact doing science.”\textsuperscript{222} Consistently, Popper took it to be “the first task of the logic of knowledge to put forward a concept of empirical

\textsuperscript{219} \textit{Id.} at 805 (emphasis added).
\textsuperscript{220} \textit{Id.} at 814-15.
\textsuperscript{221} \textit{Id.} at 817.
\textsuperscript{222} Schwartz, \textit{supra} n. 44, at 164 n. 47.
science, in order to make linguistic usage, now somewhat uncertain, as
definite as possible, and in order to draw a clear line of demarcation
between science and metaphysical ideas."\textsuperscript{223}

Another legal scholar, Margaret Farrell, in her oft-cited piece,
says \textit{Daubert} is a confused opinion, reflecting the competing
epistemological positions arising in scientific positivism and
constructionism.\textsuperscript{224} She argues that \textit{Daubert}'s emphasis on the
scientific validity of principles and methodologies (its positivism) is
internally inconsistent with its refusal to "delegate to the scientific
community authority to determine through its 'general acceptance' or
some other means" scientific claims to truth,\textsuperscript{225} and its asking instead
"how law can construct a 'law of science'" (its constructionism).\textsuperscript{226}
Here, again, the scholar's argument rests on an invariantist assumption
about knowledge. Her analysis is that \textit{Daubert}'s delegation to legal
reasoners made sense to its proponents because they were anti-realists
who assumed the known world was constructed relative to the concepts
imposed by each group.\textsuperscript{227} But once we realize knowledge under Rule
702 means something different from knowledge in the scientific
laboratory, Farrell's inconsistency thesis collapses.

Brewer's naturalized epistemology finds a practical, albeit
somewhat antiquated, application in his abductionist model of legal
reasoning. Peirce recovered abduction as an Aristotelian variation on
the logical form \textit{modus ponens}.\textsuperscript{228} Brewer sets out the basic abductive
pattern thusly:
\begin{align*}
\Theta \\
\phi \rightarrow \Theta \\
\text{Therefore,} \\
\phi
\end{align*}

\textsuperscript{223} Karl R. Popper, \textit{The Logic of Scientific Discovery} 38-39 (Basic Books, Inc.
1959) (emphasis in original).
\textsuperscript{224} Margaret G. Farrell, \textit{Daubert v. Merrell Dow Pharmaceuticals, Inc.:}
\textsuperscript{225} Id. at 2187.
\textsuperscript{226} Id. at 2198.
\textsuperscript{227} Farrell, supra n. 224, at 2192-93; see Michael Devitt, \textit{Realism and Truth} 157
\textsuperscript{228} See Charles Sanders Peirce, \textit{Reasoning and the Logic of Things: The Cambridge
where $\Theta$ is some explanandum, $\phi$ some explanatory hypothesis, and "$\phi \rightarrow \Theta$" the proposition that $\Theta$ would follow from or be explained by $\phi$ if indeed $\phi$ were true or otherwise adequately warranted.\(^{229}\) We need not reiterate Brewer's model here; its aim is to explain the "complex network of judgments" that must occur "in every act of practical epistemic deference."\(^{230}\) Presupposing epistemic invariantism, Brewer's goal is to show, by a naturalist process, how lay evaluations of expert opinions must yield arbitrary outcomes.

B. **DAUBERT'S CONTEXTUALISM**

Contextualism makes sense of Rule 702, Daubert, and the law's entrusting practical reasoners with an evaluation of scientific validity. Farrell's constructivist interpretation multiplies entities beyond necessity; we need not ascribe an implicit anti-realist philosophy to Justice Blackmun and the Supreme Court, nor a relativistic Kantianism. The court was concerned with the reliability of knowledge claims. Nor need we agree with Brewer that Daubert means to convene lay panels to resolve issues akin to Fermat's Last Theorem. Daubert rejects the view that finding truth in the courtroom is the same as finding it in the laboratory. The most straightforward and sensible explanation is that Daubert coheres with the view Gail Stine expresses, that "[i]t is an essential characteristic of our concept of knowledge that tighter criteria are appropriate in different contexts."\(^{231}\)

Invariantism is, to some extent anyway, a dogma. Law's incompatibility with that dogma explains Daubert. Scholars' adherence to it explains their collective complaint. This analysis comports with Keith DeRose's understanding of why philosophers have dwelled on skepticism, and why skepticism strikes us as threatening. At high enough semantic standards for knowledge, we cannot truthfully say we know the evil demon is not deceiving us. But Moorean knowledge is plentiful in everyday conversational contexts. What the skeptic is doing is "changing the subject," transposing his high-octane 'know*' onto our regular 'know.' The threat arises from

\(^{229}\) Brewer, supra n. 13, at 1658.

\(^{230}\) Id. at 1663 (omitting Brewer's emphasis).

\(^{231}\) Gail Stine, Skepticism, Relevant Alternatives, and Deductive Closure, 29 Phil. Studies 249, 254 (1976); see generally David Lewis, Scorekeeping in a Language Game, 8 J. Phil. Logic 339 (1979); Peter Unger, The Cone Model of Knowledge, 14 Phil. Topics 125 (1986).
the fact that, under the contextualist theory, the skeptic is simply manipulating the *usual* and *familiar* mechanisms for raising epistemic standards, and so his "use of 'knows' would much more likely pass for what ordinarily goes on with the use of the term."\(^{232}\)

In a similar way, *Daubert* was easy to write, and not really difficult to implement, because it, too, applies the usual and familiar mechanisms for shifting epistemic standards. Were contextualism our explicit world view, the case's oft-claimed flaw (the amateur scientist objection) would seem not troublesome at all, and Brewer's "two-hat" solution would seem even more bizarre.

This article derives a contextualist paradigm from Annis's effective example. Jones, an ordinary, non-medically trained person, has the information that polio is caused by a virus. When asked what justification he has for that belief, he responds that he read reports of Dr. Salk's conclusions in the *New York Times*. Given what Annis labels Jones' "issue-context,\(^ {233}\)" we would rightly say that he knows polio is caused by a virus. His gathering of true information from the *Times* is consistent with his level of epistemic competence, and, importantly, the stakes involved are low—Jones is not going to diagnose patients or prescribe cures.

But now Smith, taking her examination for the M.D. degree, is asked to discuss polio's cause and to document the sources of her understanding. Smith, who *will* be expected to diagnose and treat, gives precisely the same answer Jones gave. Given Smith's issue-context, we would rightly say she does not have knowledge. Smith's appropriate objector group, the class of qualified medical examiners, would deem Smith's response deficient. Jones and Smith are in the same position to know polio is caused by a virus, yet there is not any conflict between our ascribing different truth values to "S knows that p" depending on issue-context. Smith's perceptual apparatus is high level, and the risks associated with error in her case are great.

Further, given Smith's context she would be expected to rule out alternatives to *p* that would not arise for Jones. A medical article may have challenged the integrity of Salk's electron microscope; perhaps Dr. *X* in New Zealand has an obscure, contrasting theory; maybe Dr. *Y* claims Salk has mischaracterized the virus's nucleic acid or the structure of its capsid. Smith's *New York Times* justification would not

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233. Annis, *supra* n. 150, at 216.
be epistemically weighty enough to do the required work. As DeRose says:

What the context fixes in determining the “content” of a knowledge attribution is how good an epistemic position S must be in to count as knowing that \( p \). The mentioning of alternatives..., when there is no special reason for thinking such possibilities likely, can be seen as raising the strength and changing the content of “know” because the ability to rule out such alternatives would only be relevant if one were after a strong form of knowledge (if one were requiring the putative knower to be in a very good position in order to count as knowing).  

Annis’s example is effective because it jibes with our ordinary use of ‘knows.’ We really would say, in our everyday speaking, that Jones knows but Smith does not. It is compelling to say, as does Paul Grice, that we must presume classes of statements we use in ordinary talk are correct. Put differently, “it is almost certainly (perhaps quite certainly) wrong to reject as false, absurd, or linguistically incorrect some class of ordinary statements if this rejection is based merely on philosophical grounds.” Peirce says it this way: “We cannot begin with complete doubt. We must begin with all the prejudices that we actually have when we enter upon the study of philosophy.” If this is basically right, the invariantists are the ones who really have the burden of rebutting our everyday contextualist mechanisms, not the other way around.

Robert Hambourger’s formulation of the contextualist view of knowledge usefully synthesizes ordinary use with the traditional epistemological concern for a fixed definition of knowledge: “[W]e should say that there really is only one sense of ‘know’ involved here, but that the amount of evidence it requires for us to know something varies with indefinitely many standards of caution.” Let us give the polio/virus personae courtroom roles, Smith being an expert witness,

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Jones a lay juror. Smith testifies that she has studied a lot, has so many degrees and holds so many professional positions. Based on all her expertise, she opines that Company X’s toxic product could not have caused L’s polio, because Y, polio is caused by a virus. Believing Smith, Jones now also knows at least that much—that polio is caused by a virus.

Under Federal Rule of Evidence 705, mentioned in the preceding subsection, Smith need not testify to the facts, data, or studies justifying her belief about polio, assuming that belief is the expert’s “opinion or inference.” Rule 702 serves the policy goal of “promot[ing] the trier of fact’s search for truth” while at the same time eliminating the confusion often caused by hypothetical questions excavating for the underlying data. And under Rule 703, the facts, data, or studies underlying her beliefs need not be admissible in evidence (hence not conveyed to the fact-finder) if that underlying data is “of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject . . . .” As Jones lives his life months and years after jury duty, and even as he may forget Smith, he will have JTB in Y, but the nature and amount of the evidence will be quite different from that supporting Smith’s JTB.

Stewart Cohen, too, tries to demonstrate that knowledge has a social component, and that this social component is best seen as demonstrating “that attributions of knowledge are context-sensitive.” This article will not go through every step in the reasoning, because it is Cohen’s argument and thus already done, but here is the idea simplified: suppose our epistemic agent S has a good reason r for believing a proposition p. S knows r, but suppose S also knows d, which is a defeater, i.e., a good reason to believe p is false. So S will not believe p. But defeaters can be very obviously relevant, or only quite obscurely so. The relevance of d might be obvious intersubjectively—“intersubjectively evident”—but not discerned personally by S. It is understandable how things can now become complex, because defeaters may themselves have undermining defeaters, and these in turn may have restoring defeaters, all played out

240. Fed. R. Evid. 703.
on a grid consisting in *ideally* good reasons (prima facie good reasons, plus restoring defeaters for every undermining defeater), *intersubjectively* good reasons, and *subjectively* good reasons.

Now if $d_1$ is subjectively opaque for S, because he is too dense to appreciate its relevance, but obvious *intersubjectively*, *i.e.*, relative to a socially determined standard, S fails to know $p$ on the basis of $r$. But it is reasonable to assume varying levels of intersubjective obviousness and opacity. If knowledge is subverted by defeaters only up to a certain level of intersubjective opacity, Cohen says, "the level at which defeaters undermine knowledge is socially determined."242

If S has ideally good reasons for believing $p$, possesses a subjectively evident undermining defeater $d_n$, but a subjectively opaque restoring defeater $d_r$, then S fails to know. If $d_n$ is subjectively opaque but intersubjectively evident, and $d_r$ subjectively opaque, S also fails to know $p$ because he does not appreciate $d_r$’s effect. The end is that S knows $p$ when an intersubjectively opaque undermining defeater he has defeated by a subjectively opaque restoring defeater, but he fails to know that $p$ when the undermining defeater is intersubjectively evident. And this is how we establish knowledge’s social component: “Whether a person’s reasons give him knowledge depends on intersubjective standards for discerning the effects of defeaters."243

The next step is to go from this social component to the idea that attributions of knowledge are context-sensitive. The question is: How are the intersubjective standards determined? What is intersubjective “exist[s] between conscious minds.”244 Conscious minds cluster in social groups. So determining intersubjective standards will reasonably depend on the social group. Which one? S’s? S may belong to an unintelligent society for whom most undermining defeaters are opaque. Ours? If we are geniuses (the social group being *we* flexibly defined), clearly S’s unintelligent society would not use our standards. But that is the point. We may correctly deny knowledge to S at the same time S’s social group correctly attributes it, all without contradiction. Hence contextualism.

The difference between this sort of contextualism and the constructivism Farrell uses in her critique is that, for the proposition “S knows that $p$,” contextualism entails the shifting meaning of ‘knows’

242. *Id.* at 8.
243. *Id.* at 11.
depending on social (more accurately, epistemic) context, whereas constructivism posits a shifting meaning of ‘p,’ complete with separate and distinctive standards of rationality.\textsuperscript{245} Neither Farrell nor Brewer, nor other post-\textit{Daubert} scholars, consider the contextualist alternative. Most view \textit{Daubert} as instructing courts to undertake the onerous task of the naturalized epistemologist vis-à-vis scientific expertise, a view which, if accurate, would indeed be explainable, as Farrell wisely perceives, by positing \textit{Daubert}'s implicit constructivism.

Farrell and Brewer, like other anti-\textit{Daubert} scholars, misapply their own naturalized assumptions when they get to analyzing the court’s practice in \textit{Daubert}. Brewer closely examines how non-experts must reason in epistemically deferring to expert opinions, thus developing his abductive model. It seems, however, that a close examination of how courts reason when articulating an epistemic standard must reveal this: courts do not start from and build on an understanding of science, the very thing Brewer emphasizes they lack, but rather a legal view of evidentiary mechanisms and ways legal reasoners “know” things, the very thing courts \textit{do} have expertise about.

If \textit{Daubert} intends to fashion guidelines by which non-experts might appropriately use expert testimony to “ascertain the truth”—the goal set by Rules 102 and 702—about the pertinent science well enough to assess each party’s position in relation to their respective evidentiary burdens, then the court was likely concerned with the meaning of ‘knows’ in the proposition “S knows that p.” The court’s intent was to fashion precisely such guidelines. The best explanation of \textit{Daubert}, then, is not constructivism but contextualism; the court assumed the shifting meaning of ‘know,’ depending on epistemic context, and built its ruling on the attendant assumption that factfinders are able to weigh competing scientific testimony without having a scientist’s “understanding” of the subject matter, as Brewer uses the term.

In and of itself, the latter assumption is not necessarily contextualist, but it has ample contextualist applications. For instance, a lay juror may know with the expert witness that F’s quantitative x-ray microanalysis is likely more precise and sensitive than G’s, because he has followed the expert’s explanation that F used counting times of 10 to 100 s/point while G’s longer ones have caused instrument drift; but

the juror will not know the requisite formulae for real standard deviation, mean x-ray counts, and so forth, underlying that assessment.

This can be put differently by explaining Daubert based on DeRose’s account of the standard-inducing mechanism. In Solving the Skeptical Problem,246 DeRose develops Robert Nozick’s subjunctive-conditionals account of knowledge,247 proposing the Rule of Sensitivity:

When it is asserted that some subject S knows (or does not know) some proposition P, the standards for knowledge (the standards for how good an epistemic position one must be in to count as knowing) tend to be raised, if need be, to such a level as to require S’s belief in that particular P to be sensitive for it to count as knowledge.248

“Sensitive” here is defined in relation to P’s truth value: S’s belief that P is insensitive if and only if S would have the belief even if P were false.249

Aided by the idea of a rule of sensitivity as our standard-inducing mechanism, Daubert is efficiently and, hopefully, elegantly explained. Daubert affords (imposes upon, saddles . . . with, most would say) the court a gatekeeping task meant to ensure that the jury’s belief in P*—being a scientific proposition at issue in the case—is sensitive to the truth of P*. This becomes more difficult, and insensitivity more likely, when expert testimony failing to meet Daubert’s reliability criteria reaches the jury. Again, Daubert’s rule does not entail that the court have scientific knowledge to fulfill its gatekeeping duty. The Daubert reliability factors are designed to be solvable by lay persons, and to provide a translation scheme “that people standing outside of science could apply to determine whether purported scientists are in fact doing science.”250

It is conceivable, though, that cases may occasionally arise in which even a threshold determination of relevance requires a

248. DeRose, supra n. 246, at 36.
250. Schwartz, supra n. 44 and accompanying text.
sophisticated scientific grasp of esoteric principles. Suppose, for instance, that P has sued D for patent infringement over a device designed to measure gravity waves. Each device is ground-based, and incorporates features that compensate for atmospheric distortion of light. The similarity of those features is what is in dispute, and each side has experts ready to opine on that issue. But if detection of gravity waves is not mediated by optical readings, that testimony is not relevant, and P should win summary judgment. The relevance issue in this particular case is over the average non-expert’s head.

That judicial knowing occasionally requires scientific knowing, however, does not weaken the contextualist thesis, nor does it support Brewer’s call for a blue-ribbon judiciary. Quite the contrary. The judge has to know enough to rule in all circumstances. Were law an invariantist institution, there would be no specific legal mechanism in place that expressly acknowledged as anomalous the case in which the judge may not be able to rule without outside scientific assistance. Instead, law would align with Brewer in gathering that judicial ability to know things about experts was the aberration. But Rule 706 is such a mechanism, and it prescribes that, in the isolated and unusual case in which a courtroom ruling needs a scientist’s understanding, "[t]he court may on its own motion or on the motion of any party enter an order to show cause why expert witnesses should not be appointed . . ., and may appoint expert witnesses of its own selection."

It is also worth noting that, both historically and under Rule 706, patent litigation has been specially fertile for the judicial appointment of experts. Thus, in the universe consisting of all types of legal cases, patent cases have disproportionately shown uncharacteristically narrow gaps between judicial and scientific knowledge. It is revealing.

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251. Michael Levin has suggested a closely related hypothetical.


that lawyers working in patent law firms are often expected to have had technical or scientific training, in addition to law school. So while patent hypotheticals may tend to tilt in favor of the invariantist position, this tilt is unrepresentative, and ultimately highlights the variantism that pertains in legal cases over all.

Next, this article attempts to bolster the contextualist thesis by discussing Fred Dretske. In The Pragmatic Dimension of Knowledge, he argues against contextualism and for an invariantist approach to knowledge, and in Two Conceptions of Knowledge: Rational vs. Reliable Belief, he favors a “bottom-up” naturalized epistemology. Juxtaposing an aspect of his reasoning in Pragmatic Dimension against an aspect of Two Conceptions provides a contextualist argument he would deny.

In Pragmatic Dimension, Dretske “proposes to think of knowledge as an evidential state in which all relevant alternatives (to what is known) are eliminated[,] which makes knowledge an absolute concept . . . .” As for contextual factors such as the proximity of (misleading) counterevidence, community standards, and the stakes involved in what is known or in someone’s knowing it, Dretske says, “personally,” he “happen[s] to think . . . [t]hese factors affect not whether something is known, but whether it is reasonable to say you know or to think you know.”

For Dretske, relevant alternatives that a knower must be in an evidential position to exclude comprise the Relevancy Set (RS) with respect to a knowledge claim. The RS is a subset of the Contrasting Set (CS), situations necessarily eliminated by what is known to be the case. Items in CS not in RS are irrelevant alternatives, which the knower “need not (although he may) have a justification for thinking do not exist.” So in Kumho Tire, discussed above in Part II, in

257. Dretske, supra n. 255, at 52.
258. Id. at 53. This article also posits and responds below to such a warranted assertability objection to the contextualist view.
259. Id. at 57.
260. See supra nn. 47-60 and accompanying text.
which Carlson, the tire expert, said too much, negating his knowledge claim, Dretske’s interpretation would be this: Carlson inflated his RS and thereby assigned himself an enhanced set of possibilities he had to be in a good enough evidentiary position to exclude. As his RS approached his CS, his knowledge claim faltered.\footnote{261}{See generally Lewis, supra n. 152, at 561; Catherine Z. Elgin, The Epistemic Efficacy of Stupidity, 74 Synthese 297 (1988).}

What determines the membership of an RS? The following is the first of Dretske’s criteria, which derives from our use of “contrastive focusing.”\footnote{262}{Dretske, supra n. 255, at 58.} S’s claim to know that Alhambro sold his computer to Benson is not (necessarily) the same thing as S’s claim to know that Alhambro sold his computer to Benson; neither claim is the same as S’s claim to know that Alhambro sold his computer to Benson, and so on. Focusing on sold, S has to rule out the possibility that Alhambro gave the computer to Benson, but he hardly needs any justification for the rest of the claim, and he can take for granted its incidental elements. If the focus of S’s claim is on Benson, S must be in a position to eliminate the possibility that Alhambro sold the computer to Benson’s twin, or to Christophe.

So when S claims to know (1) Alhambro (2) sold (3) his (4) computer (5) to Benson, he is not really claiming to know (1) through (5) (otherwise RS approaches CS—a skeptic’s scenario), and the conversational context allows us to single out S’s actual knowledge claim. On a related issue, Dretske puts the point this way:

If I say that I could tell that your sister was amused by my funny story, I do not thereby claim to know that she is really your sister, really a human being (rather than a cleverly contrived robot), or really the sort of creature that could experience amusement. These possibilities, although certainly relevant to the truth of what I say, in the sense that if they were realized I would not know what I say I know, are not possibilities that I need to be in an evidential position to exclude to know that your sister was amused by my joke. I was, as it were, taking it for granted that she was your sister (hence, a human being, a creature that could experience amusement), and I was claiming to know something about the thing so referred to. On the other hand, if I said that I could tell that the object in the corner (that happened to be your sister) was amused by my funny story, the possibility that it is a robot
becomes a relevant alternative, one that I am (by this choice of words) accepting epistemic responsibility for excluding. 263

Now we turn to Two Conceptions. In that article, Dretske argues in favor of a “bottom-up” epistemology, an externalist theory by which “knowledge is a matter of getting yourself connected to the facts in the right way (causally, informationally, etc.), whether or not you know or understand that you are so connected . . . .” 264 By Dretske’s bottom-up view, “Fido is (through normal eyesight) connected in the right way to his food bowl; hence, he can see (hence, knows) that the bowl is there, next to the table.” 265 Then, “Fido has got exactly what we have got—knowledge—but he cannot express it the way we can[]. Fido knows his food bowl is over there by the table and I know his food bowl is over there by the table . . . .” 266

Those are Dretske’s theses, and putting his two articles together, this is the problem: Fido’s claim—or Dretske’s claim on Fido’s behalf—is to know his food bowl is over there by the table. My similar claim will usually focus contrastively on only one of the following six elements: (1) Fido’s (2) food (3) bowl (4) is over there (5) by (6) the table. I am not necessarily claiming to be in an evidentiary position to exclude alternatives with regard to each element. A guest may have switched the positions of Fido’s (outwardly identical) food and water bowls; she may have mistaken my cereal bowl for Fido’s food bowl, and so forth. But Fido, it seems, cannot claim anything at all; if he knows it is because he had true belief caused by a reliable mechanism, his visual perception. Dretske’s claim on Fido’s behalf is unindividuated, the focus falling evenly across the claim. Fido knows all this: (1) his (2) food (3) bowl (4) is over there (5) by (6) the table.

This means that, if Fido knows at all, he implicitly makes a richer knowledge claim than a human does from the same epistemic position. Fido was an abused stray and he takes nothing for granted. His knowledge claim does more epistemic work than my own. We have to assume this cannot be so. We do not deny Fido knows something, or knows in his way. He sees, learns and responds. What we can deny is that Fido knows “in the same sense in which we know things,”267 and Dretske’s underlying claim that knowledge “is an absolute concept.”268

263. Id. at 59-60.
264. Dretske, supra n. 256, at 82.
265. Id.
266. Id. at 83 (emphasis added).
It makes sense instead to take ‘know’ in Fido’s (dog) case—say, $\text{know}_d$—as meaning something different from ‘know’ in a human’s case—say, $\text{know}_h$.

C. COUNTER ARGUMENTS

The point of this portion of the article has been to show how contextualism explains law’s epistemology. This is a bit different from arguing for contextualism as a theory of knowledge, and so needing to refute the counterarguments. If law is implicitly contextualist, though, this would tend to strengthen the theory, because it would show that, at least in law, shifting epistemic standards are the usual and familiar mechanisms by which we handle knowledge claims.

By the same token, good arguments against contextualism bolster the contrary claim that our epistemic standard must be fixed. This, in turn, would create pressure to construe Daubert in a non-contextualist manner. So in this subsection, the article constructs and responds to three arguments against the position it is taking.

The first argument combines a warranted assertability objection with Leiter’s outh implies can principle. The principle requires that normative epistemological advice address knowers in the actual, not some ideal, world. Thus, epistemic advice of the form “‘knowers ought to do A before forming a belief about Z,’ must imply that ‘knowers can do A before forming a belief about Z.’)” Leiter’s claim is that the rule in Daubert “seems insensitive to the outh implies can’ principle as applied to judges.” That is consistent with what Brewer and other scholars say, and the claim is compelling only if we adhere to an invariantist approach.

But the outh implies can principle may regain potency if used as part of a warranted assertability objection to the claim that Daubert displays a contextualist perspective. The objection rests on an intuition that the anti-Daubert scholarship shows is forceful. Where E stands for an expert, and $P^*$ is a scientific proposition, we can that say a judge’s statement that “E knows that $P^*$” seems, intuitively, not quite right; but the judge’s statement that “E does not know that $P^*$” also seems off.

267. Id. at 84.
268. Dretske, supra n. 255, at 52.
269. Leiter, supra n. 44, at 815 (emphasis added).
270. Id.
By the *ought implies can* principle, the judge is, in either case, conveying the false implicature that she *can*—that is, comprehend the science. The false implicature is resolved, not by concluding that the judge *knows* in some context-sensitive way—the point is that, intuitively, the judge *does not* know—but by recognizing that non-expert judges are simply not warranted in asserting scientific knowledge claims.\(^{271}\)

A response to this warranted assertability argument is that it begs the question, in effect, by taking for granted the presuppositions about legal decision making already shown to be specious. In other words, the objection assumes without proving an invariantist intuition about the nature of our knowledge claims. It is also the case that, so far, scholars challenging *Daubert* have been assuming without showing that law's epistemology is invariantist. These scholars may have the burden on this issue.\(^{272}\)

When belief is fixed in the scientific community, and that belief is justified and true, it may also be fixed in law, though on the basis of a different quality and quantity of evidence.\(^{273}\) If we say scientists never really know, because "[s]cientific conclusions are subject to perpetual revision,"\(^{274}\) then legal reasoners also do not know; but then, also, nobody knows, and we are left with formidable skepticism. But if scientists *do* know many things, notwithstanding revisability—and although "every work of science great enough to be remembered for a few generations affords some exemplification of the defective state of the art of reasoning of the time it was written"\(^{275}\)—then at time \(t\) they can convince us they know \(P^*\), thus that \(P^*\) is true, and we may then know \(P^*\) as well.

If we do not beg the question, the *ought implies can* warranted assertability objection will not disturb the idea that the non-expert *can* know at least that \(P^*\), without necessarily having to know why \(P^*\). If evidence is explanatory because it is relevant, what is explained are the factual elements of the cause of action (\(\Omega\) causes \(\psi\), D knew or *should have known* \(\Omega\) causes \(\psi\), D sold/marketed/distributed \(\Omega\), P was exposed to \(\Omega\), \(\Omega\) caused \(\psi\)). Explaining each explanatory thing threatens what

\(^{271}\) See generally DeRose, *supra* n. 100, at 196-203.

\(^{272}\) See *supra* nn. 235, 236 and accompanying text.

\(^{273}\) See Peirce, *supra* n. 160, at 129.


\(^{275}\) Peirce, *supra* n. 160, at 121.
lawyers call a “slippery slope” or a “trial of collateral issues,” and what philosophers call “infinite regress.” Hence, Rules 703 and 705 of the Federal Rules of Evidence. Mathematicians say, certainly, Wiles has proved Fermat’s Last Theorem. Believing him, as we ought, we know, for all integers \( n > 2 \), \( x^n + y^n = z^n \) has no solution in positive integers.

A second argument, a variant on the warranted assertability objection, may arise from the court’s metalinguistic job during the Daubert hearing. In its gatekeeping role, the court is making a knowledge claim about the expert’s approach and methodology and is saying that, in that context, “E knows P**,” or “E knows what it takes to know that P**” (by law’s standard, the Daubert criteria), and thus “E’s testimony will place the fact-finder in a better position for ascertaining truth,” that is, for acquiring JTB. This knowledge claim is first order and concerns E’s general claims, such that “E knows how to do his science well enough for law’s purposes.” Regarding E’s specific claims, the gatekeeper’s focus, as Daubert says, must be “on principles and methodology,” not conclusions. The judge’s real statement about those scientific claims is second order, not “E knows that P**” (impliedly, by science’s light), but “E has a right to say P* (by law’s standard) and thus may testify.”

If Daubert really has to do mostly with such metastatements, then the case may not significantly implicate the shifting meaning of ‘knows’ in ‘E knows that P*,” but rather the epistemologically weaker ‘may testify.’ This could be a weighty objection to any generalized contextualist argument based on Daubert.

An effective contextualist response can begin in at least two ways. It should emphasize that (1) the court does make a knowledge claim in concluding, “E knows what it takes to know that P**” (or “E knows P**”), and (2) a conflation exists in the Daubert literature between the court’s role as gatekeeper and the fact-finder’s official task to ascertain truth. Appreciating the distinction expressed in the latter debilitates the “amateur scientist” objection, while leaving the contextualist argument intact. The “amateur scientist” objection is diminished because what is implied is that the court does not itself have to know P*, and saying whether E may testify to P* is an easier chore. Again, determining whether an expert’s proffered testimony satisfies

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276. Daubert, 509 U.S. at 595.
the Daubert factors does not ordinarily saddle the judge with the need to attain a scientist's expertise.

At the same time, the second emphasis abides contextualism: if the litigant meets its burden of proof by bettering equiprobability, the fact-finder will be justified in believing E knows that P*, and thus itself that P*. Fixing a belief about the expert’s conclusions is the fact-finder’s first-order responsibility. Brewer’s invariantism says that the non-expert fact-finder must inevitably be incompetent, contextualism says otherwise. It is here that the contextualist theory does most of its work. Of course, this does not mean that a jury’s finding will not sometimes be insupportable, nothing more than a coin toss. It is just that the invariantist argument why this must be so does not hold up.

The first two arguments against a contextualist view of Daubert dovetail into a third, which we derive from Stephen Schiffer’s challenge to contextualism’s error theory. The error theory Schiffer attributes to contextualism is that “people uttering certain knowledge sentences in certain contexts systematically confound the propositions their utterances express with the propositions they would express by uttering those sentences in certain other contexts.” After all, is the contextualist not saying that Brewer and lots of other intelligent people have been confounding the proposition expressed by their utterance in the legal context with the proposition they would express in the scientific one?

Schiffer speculates that in defense contextualists would posit a “hidden-indexical” theory, whereby knowledge sentences are assimilated to sentences like “It is raining” or “He is short.” Such sentences are easily seen to contain unarticulated constituents: “propositional constituents that are [not] the semantic values of any terms in the uttered sentence.” So an utterance of “It is raining” really expresses the proposition, “It is raining, here in New York,” and “He is short,” really expresses, “He is short for an NBA center.” The problem, says Schiffer, is that the ordinary speaker knows full well that she is asserting here in New York, or for an NBA center, but the

277. See Schiffer, supra n. 249, at 325-29.
278. Id. at 325.
279. Id. at 326 (citing John Perry, Thought without Representation, 60 Proc. of the Aristotelian Socy., vol. 60, 137-51 (Supp. 1986); Stephen Schiffer, Belief Ascription, 89 J. Phil. 499 (1992)).
ordinary person asserting a knowledge claim will say she means what she said, nothing more.

Schiffer similarly conceives and refutes an “indexical-verb” defense of the contextualist error theory. By that defense, the utterer of a knowledge claim is implicitly using the verb “to know” indexically, so that “know” in the statement “S knows x” expresses S knows x by a certain standard. But here, again, it seems incredible that “those uttering knowledge sentences are both referring, unbeknown to themselves, to different knowledge relations and confounding the knowledge relations to which they [are] unknowingly referring.”

So how is it that, unbeknown to themselves, Brewer et al. are confounding contexts? Does not the improbability of this central feature of this article’s argument render it implausible? Well, some pretty astute philosophers have said, “Philosophers are notoriously subject to illusion, and to mistaken theories.” We are dealing, after all, with theories, and philosophers have devised a number of contrasting and often conflicting epistemological ones—contextualism, for example. If invariantist theories of knowledge overlap with contextualism in the ways suggested, it seems less odd that scholars would simply make the traditional (invariantist) assumption. In all events, if invariantism is right, it should carry ample explanatory power—explanatory success generates “philosophical optimism.”

But invariantist explanations of Daubert have been problematic, and this gives us a reason to ask whether contextualism might fare better.

It seems that the misguided nature of Brewer’s two-hat solution attests to the speciousness of his epistemological assumptions. Law’s evidentiary and fact-finding mechanisms are the long-standing

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280. Schiffer, supra n. 249, at 327. Schiffer finally rejects a “vagueness” defense—that “to know” is vague and there is a certain content variability inherent in vagueness—as “not a semantic story to be taken seriously.” Id. at 327-28.


products of a lot of deliberation and trial and error. They play a complex societal role in legitimizing law’s rule. Heavy legal voices put it this way: “[For] the settling of civil property . . ., [t]he trial by jury is that trial by the peers of every Englishman, which, as the grand bulwark of his liberties, is secured to him by the great charter.”

“Our notions of what a proper jury is have developed in harmony with our basic concepts of a democratic society and a representative government.”

“It is part of the established tradition in the use of juries as instruments of public justice that the jury be a body truly representative of the community.”

Brewer accounts for none of this in his blanket proposal to delegate responsibility for deciding cases to blue-ribbon panels and to create a class of expert legal managers.

Moreover, dogma can afflict schools of thought. As stated earlier, invariantism may be a substantial dogma providing the filter through which legal scholars have been viewing Daubert. The ordinary juror or judge would say, contrary to Schiffer, that her utterance “E knows that P*” (or “E knows P**”) is relative to a certain standard. The practical reasoner is sensible enough both to believe courtroom testimony that polio is caused by a virus, and to understand that a physician has to have a more sophisticated justification (than hearing it in a courtroom) for the same assertion before claiming truly to know. This point is built into the language of Rules 703 and 705, as well as parallel state court provisions: law’s evidentiary schemes explicitly intend that expert witnesses will state their beliefs without always saying what underlies those beliefs. This article appears then to deny that contextualism really requires an error theory, at least in the courtroom, and perhaps everywhere outside the debate over skepticism.

In any event, the issue should be not how we can err, but what is our best theory of knowledge. Law provides a good focal point, because it is there that the contextual nature of our knowledge claims is often so glaringly apparent.

V. CRITICIZING DAUBERT

None of this article’s analysis should be read as a defense of Daubert’s standard. It is neutral on that issue here, and only argues

that *Daubert*’s critics have been implicitly accepting, as their point of departure, a flawed approach to law’s epistemology. What they ought not suppose is that *Daubert* would convene a group of lay persons to decide whether Andrew Wile’s mathematical proof really succeeded. If we assume a contextualist world, what might some criticisms of the ruling be like?

In some ways they would not be much different from what they are like now. Practitioner-type criticisms might be that the ruling incorrectly construes Federal Rule of Evidence 702, or that the *Daubert* standard fails to cohere with the federal evidentiary scheme. Such criticisms would be rebutted by the assertion that it is the Supreme Court that says what the law is. But Brewer is a reformist, too. Congress could override *Daubert* by enacting a revised evidentiary scheme, more clearly expressive of what it meant, in hindsight, in 1975.

More likely, a critic could argue that *Daubert* raises real Peircean doubts about whether its rule can engender the right sort of judgments—not in Brewer’s invariantist sense, but in some other sense. For instance, it seems the criticism in the field, so to speak, is not, “It cannot be done,” but, rather, “It does too much,” or “It does too little.” People in one camp say it was wrong of the court to liberalize the standards for the admissibility of cutting-edge novel scientific evidence. Criticism from that angle decries the potential redistribution of wealth from corporate defendants to injured plaintiffs.\(^{286}\)

Meanwhile, folks in a contrary camp rail against *Daubert*’s expansion of judicial gatekeeping from the realm of merely novel scientific evidence, per *Frye*, to the realm of all manner of scientific and technical proof. *Daubert*’s enhanced restrictiveness, looked at this way, promotes a devalued compensatory claim on the part of plaintiffs, and diminishes the tort system’s capacity for deterring product-related misconduct.

A related contextualist criticism, more purely psychological, arises from the idea that, as legal scholars wrongly assume *Daubert*’s epistemology is invariant, so will district court judges. This will skew their analyses by causing them to assign undue weight to the *Frye/Daubert* general acceptance factor, because the easiest way to be an “amateur scientist” is to find out empirically what the relevant

community believes.\textsuperscript{287} Overvaluing general acceptance for the full range of expert testimony covered by Rule 702 will result in too many restrictive outcomes. So the criticism would be that \textit{Daubert} should have been more philosophically self-aware, better understanding and explaining its own contextualism.

Another possible criticism might be along the lines that \textit{Daubert} proceedings will likely discount undermining Gettier-like\textsuperscript{288} subject factors. As DeRose explains, while attributor factors set a certain epistemic standard the putative knower must live up to, subject factors determine whether the putative knower lives up to the standards that have been set, and thereby can affect the truth value of the attribution \textit{without} affecting its content: "They affect how good an epistemic position the putative knower actually is in."\textsuperscript{289}

While the scientific community itself should recognize instances of justified scientific belief that is true merely fortuitously, or by accident, it is not evident others would. The \textit{Daubert} factors as a whole might outweigh the general acceptance element, as the scheme was designed, and allow JTB to masquerade as knowledge when it is not. It is in such a peculiar instance that competing experts, the engine of cross-examination, and other incidents of litigation may not work to expose the flaw. This is because counsel, trained to refute justification or truth claims, will be reluctant to argue for the risky proposition that an opponent possesses JTB but, nevertheless, not knowledge.

This scratches the surface. It is for another article to develop a contextually appropriate critique of \textit{Daubert}, as well as \textit{Kumho Tire}, and their progeny.

\textsuperscript{287} A few of the cases mentioned in this article perhaps show this tendency. See \textit{Kumho Tire Co. v. Carmichael}, 526 U.S. 137, 157 (1999) (finding "no indication in the record that other experts in the industry use Carlson's two-factor test"); \textit{Lust v. Merrell Dow Pharm., Inc.}, 89 F.3d 594, 597 (9th Cir. 1996) (noting the expert failed to show his method was "generally accepted by or espoused by a recognized minority of teratologists"); \textit{Zuchowicz v. U.S.}, 870 F. Supp. 15, 18-20 (D. Conn. 1994) (asking, as Brewer notes, about the experts' "qualifications," and arguably overemphasizing the "general acceptance" factor).


\textsuperscript{289} DeRose, \textit{supra} n. 168, at 921-22.
VI. CONCLUSION

It is supportable that law’s structures aim at justified belief in true propositions, and therefore knowledge. If so, law deserves a role in the philosophical discourse over which theory of knowledge may fare best. By assigning non-expert decision makers the role of assessing expert testimony, law either leaves itself open to a Brewer-like claim that only epistemically arbitrary judgments can result, or it provides a fertile ground for the elucidation of a contextualist epistemology. This article has argued the latter because this view seems to be in line with the way things are. Brewer’s course seems incoherent or unacceptable in important respects, and Daubert, whatever its legal and policy flaws, resists a fully satisfying invariantist explanation.